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AN ANALYSIS OF ONE HUNDRED CASES OF FIBRO-MYOMATA UTERI,

WITH SPECIAL REFERENCE TO THEIR DEGENERATIONS AND COMPLICATIONS.

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AFTER reading Dr. Cullingworth's paper in the January number of the JOURNAL OF OBSTETRICS AND GYNÆCOLOGY, in which he asks other observers to record their experience, I venture to submit the following analysis of 100 cases.

Like Dr. Cullingworth's series of cases, mine are consecutive, and not selected. They are simply all the cases of fibroid on which I have operated between July, 1892, and August, 1902. I have included 6 cases treated by oöphorectomy, 10 cases treated by vaginal hysterectomy, and 3 by Péan's 'morcellation,' but I have not included any case of fibroid polypus; also I have not included 2 cases of exploratory incision, in which large smooth uninodular tumours were found, because, although they presented an appearance suggestive of their being sarcomatous, the tumours were not removed, and no microscopical examination was made.

I venture to think that a further subdivision in the classification of fibroids is desirable. When several fibroid growths occur in different parts of the same uterus, they are certainly 'multiple fibroids.' When there is one mass embedded in the uterine musculature, it is certainly interstitial; but there are two distinct varieties of interstitial fibroids, which are often confused with each other. In one of these avrieties the growth consists of many whorls of fibro-

myomatous tissue, nearly white in colour, enclosed in a capsule, and easily separable from the uterine wall. In the other variety of interstitial fibroid there are no distinct whorls, but an intricate meshwork of strands of tissue, pink in colour, having no capsule, and more or less interlaced with and inseparable from the surrounding uterine musculature.

Were it not for the risk of still further confusing students, it might be well to call the former variety 'multinodular' fibroids, and the latter 'uninodular.' Perhaps an escape from the difficulty may be found by letting the many whorled, but single, mass retain its usual name of uninodular fibroid, and reserving the new name 'monoma' for the unencapsuled variety.

Eight patients out of the hundred died. Details of these cases are given below. The causes of death as ascertained on post-mortem examination are:

In Case 5, death on fourth day ...	? Asthenia or toxæmia.
In Case 8, death in four hours ...	Shock.
In Case 98, death within twenty-four hours	Shock.
In Case 25, death in four or five hours	Hæmorrhage.
In Case 42, death in a few hours ...	Hæmorrhage.
In Case 18, death on tenth day ...	Sepsis.
In Case 59, death on sixth day ...	Sepsis.
In Case 69, death on sixteenth day	Sepsis.

Case 5.—Mrs. B., aged forty-eight, mother of two children, complained of abdominal pain, excessive loss, difficulty in micturition, and unwieldy size of the abdomen. On examination two masses were found, one lying forwards and to the left, pressing on the bladder; the other, deeper and much larger, extending up to the umbilicus. The sound passed 5 inches into the smaller tumour, which was evidently the enlarged uterus.

At the time of operation the large mass was found to be a smooth, uninodular fibroid, springing from the posterior aspect of the supravaginal cervix, which burrowed under the posterior parietal peritoneum, and was entirely separate from the body of the myomatous uterus, which lay free in front of it. Both the tumour and the uterus were removed. The patient did fairly well for three days, took food, and the bowels were freely relieved. After this the temperature and pulse rose, sickness set in, and the patient died on the fourth day. At the post-mortem no signs of peritonitis could be found. I conclude, therefore, that the cause of death was asthenia or toxæmia.

Case 8.—S. C., single, aged thirty, had long been under treatment for pain amounting to agony at the periods, which were profuse. She had a large tumour, about the size of pregnancy at full term. She had been operated on two years before by another surgeon, the ovaries and tubes being removed, with temporary benefit, so far as the hæmorrhage was concerned. After this she had been treated by Apostoli's method, but grew steadily worse. When I first saw her she was entirely incapacitated for her work as cook by the pain and hæmorrhage.

On opening the abdomen the tumour was found to be very adherent to

the parietal peritoneum and the bowels. It was rotated through a quarter of a circle on the cervix, so that the left Fallopian tube crossed diagonally from its right upper border. This tube was flattened out and inseparably adherent to the tumour, and looked like a length of small intestine.

The operation was long and difficult. The patient became conscious, but never rallied, and died five hours after the operation.

Case 98.—Mrs. H. The large fibroid was sloughing, a black offensive mass protruding through the os uteri. The patient was weak and septic ; she never rallied from the operation, and died in a few hours. The fibroid was removed *per vaginam* by morcellation.

Case 25.—Mrs. B., aged forty-three, mother of one child. She complained of profuse hæmorrhages and of difficulty in micturition. The tumour grew rapidly while she was under observation. At the time of operation the tumour was found to be multinodular, the ovaries were cystic, and double hydrosalpinx was present. There was profuse hæmorrhage during the operation, not from any special vessel, but from a general oozing from the depths of the pelvis. Finally, the oozing ceased, and the abdomen was closed. About four hours later the patient was very pale, with small and rapid pulse ; the wound was re-opened, and gauze packing was introduced. The patient never rallied, and died almost at once. At the post-mortem about 4 ounces of blood was found in the pelvis, but a careful examination showed all visible vessels securely tied.

Case 42.—L. S., single, aged forty-one, complained of loss of flesh and strength and increased frequency of micturition. The tumour was multinodular, some nodules undergoing mucoid degeneration, and the veins in both broad ligaments were very large. There was no undue loss during the operation, but after some hours there were signs of hæmorrhage. This had occurred from the slipping of a ligature on one of the distended veins.

Case 18.—E. B., aged thirty-two, single, complained of floodings and retention of urine. The abdomen was occupied by one large multinodular growth, and the cavity of the pelvis was completely filled by a second, the size of a child's head.

The abdominal mass, consisting of uterus and fibroids, was removed by total hysterectomy. The mass in the vagina had been freed in circumcising the cervix. It could not be brought up into the abdomen, and was delivered by means of midwifery forceps *per vaginam*. The perineum had to be incised to allow of the delivery. It was at once sewn up, but, unfortunately, with silk. For a time all went well, but finally suppuration started from the perineum, and tracked upwards towards the bladder ; an abscess formed and was opened, but the patient died on the tenth day.

Case 59.—A. J., aged thirty-six, single. In this case the hæmorrhage during the operation, especially after amputation of the uterus, was profuse, and the cervical stump was temporarily clamped. The peritoneal flaps were too short to cover the stump, which was, however, sewn together.

On the fourth day after operation the pulse and temperature rose. On the fifth day the temperature fell, but not the pulse. There was vomiting and distension of the abdomen, and she died on the sixth day.

Case 69.—S. E., single, aged forty-one, complained of difficulty in micturition, constipation, and rapidly failing health. She appeared much exhausted and very ill. The fibroid was uninodular.

Both ovaries contained cysts the size of an orange. The patient did not do well, she slept badly, and both pulse and temperature were somewhat above normal. About ten days after the operation all the symptoms became worse. A boggy mass was found in the right side of the vaginal vault. This was incised, and a small quantity of pus was evacuated. Patient died on the sixteenth day.

DEGENERATIONS OR DEPARTURES FROM HEALTH OF FIBROIDS.

In the hope of promoting uniformity I have adopted Dr. Cullingworth's classification, and found in 100 cases there were the following degenerations:

Œdematous and myxomatous	5 cases.
Sarcomatous	6 ,,
Cystic or fibro-cystic	7 ,,
Calcareous	2 ,,
Necrotic { *a.* Necrobiotic	0 ,,
Necrotic { *b.* Infected	2 ,,
Sloughing	3 ,,
Carcinomatous invasion	1 case.
	26 cases.

Thus, it appears that degenerations were found in a quarter of the whole number of fibroids submitted to operation, and that in half of these cases the degeneration was such as to directly threaten the life of the patient, without any reference to hæmorrhage or pressure-effects.

On reference to the appended table of cases, it will be found that occasionally more than one morbid change had occurred in the tumour. Thus, in Cases 35 and 52 the tumours contained cysts, and were also invaded by sarcoma. In Case 55 cystic, calcareous, and sarcomatous changes had occurred.

Some of these cases may be briefly described:

CASE 35.—Miss S., aged forty-one. Patient complained of a rapidly growing abdominal tumour and of severe constipation. On opening the abdomen the tumour was found to have rotated so as to twist the appendages. It was of uneven consistence, and from one cyst 54·5 ounces of fluid were drawn off. After the fluid had drained away, the tumour resembled hardened brain substance, and on examination parts were found to be sarcomatous. Patient did well.

CASE 52.—E. S., aged sixty-eight, single. She complained of a large and rapidly-growing tumour, with increased frequency of micturition, and of œdema of both legs. The tumour proved to be multinodular, cystic in parts, and sarcomatous in parts.

CASE 55.—M. P., aged sixty-eight, single. The patient was admitted complaining of inability to defæcate or urinate, also of rapid loss of flesh and strength. The abdomen was distended by a tumour, and the pelvic cavity was so filled that the perineum bulged and the anus gaped, as it does when a child's head is making the extension movement.

The tumour was lobed, but not multinodular; the upper part was of ordinary fibro-myomatous tissue. Lower down parts of the tumour were cystic, and other parts calcareous, while the lowest part of the growth showed sarcomatous degeneration.

These cases differ entirely from Case 12, in which there was cystic degeneration only.

Mrs. C., aged sixty-four, no children. She complained of prolapse of the uterus, and of both incontinence and retention of urine. On opening the abdomen the hand could readily explore the right side, but the left side was walled off by an expansion of peritoneum. This proved to be the unfolded left broad ligament. On incising it a large fibro-cystic tumour was found growing from near the fundus of the uterus by a small short pedicle. It was removed by myomectomy.

Had no operation been done, this tumour might have become entirely separated from the uterus, and would, perhaps, have undergone further degenerative changes.

Of the two cases of calcareous degeneration, one has been mentioned (Case 55); the other was specially interesting from its antiquity, having been known to exist twenty-two years.

Case 84.—L. B., aged fifty-nine, single, complained that she had had pain and increasing size of the abdomen since 1880. At that time she was in a hospital ten weeks, and suffered from very acute pain and much vomiting. She was told that she had a 'fibroid uterus.' After resting ten weeks, she was better, and the tumour was smaller. The next year she was again ill with vomiting, pain, and frequent micturition, and returned to the hospital for eight weeks. Attacks occurred at intervals until January, 1901, when she went to another hospital. There an exploratory incision was made, but the tumour was not touched. Since then she was in St. Luke's Home for the Dying nine months. The pain was so severe that she wished to take the chance of relief afforded by operation. The Surgical Registrar of the hospital in which the exploratory incision was made kindly wrote that the condition found was an 'immense degenerated fibroid, with dense universal adhesions, or possibly a malignant growth of the uterus.'

The patient looked very old for her age, and was absolutely white-haired. The urine was free from albumin, specific gravity 1·009, urea 1·1, reaction neutral.

The prognosis was not very hopeful, but the poor woman's condition was so miserable, and she was so eager to have even a chance of relief, that it was decided to make an attempt to remove the tumour.

The peritoneum was found to be adherent to the omentum and bowels all along the line of incision from the umbilicus to the pubes. The incision was extended upwards and to the left of the umbilicus. A part was thus found where the peritoneum could be safely incised. On passing a finger in to act as a director a calcareous mass was recognised. The peritoneum was gradually freed from its adhesions, and then the calcareous mass could be defined. It was about the size of a large orange, and was densely adherent to the stomach, transverse colon, small intestine, and tip of the vermiform appendix (which reached as high as the umbilicus). The mass was freed with great difficulty, and the serous coat of a piece of small intestine which had been injured was repaired with a Lembert's suture. Many ligatures were necessary, and when all bleeding had stopped the intestines were protected with gauze veils while the incision was slowly followed downwards. Another mass came within reach; this was not calcified, but it was badly adherent to the cæcum, sigmoid flexure and colon. As the broad ligaments came into view they were found to contain enormously dilated veins. The broad ligaments were tied with interlocking ligatures and divided. The mass could then be drawn forward. It consisted of the uterus and its outgrowing fibroids. At the

back of the mass was a long stout band; this proved to be the pedicle of a rounded fibroid, which accurately filled the pelvic cavity. This mass was drawn up, and then the uterus was amputated about the level of the internal os uteri. Flaps of peritoneum had been turned down from the anterior and posterior surfaces of the uterus, so that when the musculature of the stump had been sewn together two hoods of peritoneum could be brought together over it, and the communication with the cervix and vagina cut off.

The operation lasted one hour and forty minutes, but the patient bore it well. There was no collapse, her pulse at the end of the operation being 96 and of fair volume. Unfortunately, some superficial suppuration in the line of the stitches delayed recovery, which was ultimately quite satisfactory.

The specimens consisted of—

1. An irregular round mass, measuring 5 by 6 inches, and weighing 780 grammes (52 ounces). It was calcified all through; there was no trace of a pedicle. It was covered by a pseudo-cartilage-like envelope, by which it was universally adherent, as described.

2. The second tumour was a fibroid uterus, with twelve outgrowths, varying in size from that of a fœtal head at term to a chestnut. The largest of these outgrowths was incarcerated in the pelvic cavity, and was attached to the back of the uterus by a strand 3½ inches in length. Luckily this mass was not adherent.

Of the necrotic cases one is of great interest:

Case 75.—Miss J. W., aged fifty-two, complained of failing health and of frequent, but moderate, hæmorrhage. The tumour reached nearly to the umbilicus. It felt smooth and uninodular. Operation did not seem to be indicated, and it was agreed that the patient should be seen at intervals. About four months later she had a bad attack of pleurisy, and as this was subsiding very severe abdominal pain, with considerable fever (103°), and quick, small pulse, developed. A few days later there was thrombosis of the veins of both legs, with severe localized pain in the left groin. The patient was evidently very ill, and all idea of operation had to be deferred. After a time the pulse and temperature became normal, and it was resolved to make an attempt to remove the tumour. The tumour was smooth, uninodular, and free from adhesions. It was dark-red in colour, and soft. The unhealthy condition of the tumour and the necessity of incurring no unnecessary risk determined the choice of total hysterectomy. The tumour was evidently infected, and in parts contained a puriform fluid. The patient was very ill for some days, with a small, quick pulse, and great sense of illness. The superficial wound suppurated. There was discharge of pus through the vagina, and subsequently an abscess of the broad ligament was opened through the vagina. Later still there were small localized abscesses on the right arm and the buttocks. However, the patient gradually improved, and after several small operations for the removal of infected stitches, and the incision of little abscesses, she was able to go first home, and then to the seaside. There was a persistent sinus of no great magnitude. A year later two or three surgeons made efforts to close this sinus, unfortunately without success. The patient, I hear, died about seventeen months after the first operation.

The sloughing fibroid is well known, but it must be remembered how much more danger there is in operation where a part or a whole of the tumour is gangrenous and teeming with the micro-organisms

of putrefaction. This degeneration is to be distinguished from both the necrobiotic and the infected conditions sometimes found in fibroids explored by abdominal section. The truly sloughing or gangrenous condition is only found when one pole of a submucous fibroid (or a fibroid polypus) presents at the os uteri, or in the vagina, so that external infection can reach it.

One of the three cases tabulated is of special interest.

Case 100.—Mrs. B., aged forty-two, one child, complained of excessive menorrhagia for four years. At her last period she had severe pain, for which she was poulticed, and remained in bed some days. She said she felt a round lump in the abdomen. An intolerably fœtid odour suggested the existence of cancer, which the patient's emaciation and yellowish pallor tended to confirm. On examination the os uteri was widely dilated, and pressing through it was a black, soft, ragged mass, easily removable with a large sharp spoon and fingers. When all the gangrenous part was removed the operation was stopped on account of the patient's precarious condition. Forty-eight hours later the temperature and pulse were raised. The abdomen was very tender, and the uterus fixed in a mass of exudation. The patient was very ill. At the end of a week a further mass occupied the os uteri apparently as gangrenous as that first removed. A second operation was undertaken, and the whole tumour removed by morcellation. The uterus was left intact. Eventually the patient made a perfect recovery.

Although carcinoma was associated with fibroids in two or three cases out of the hundred, there was only one case in which there was invasion of the fibroid itself by the malignant growth. This was the following:

Case 68.—E. T., single, aged sixty-one. She complained of intermittent hæmorrhage and of a foul discharge. The uterus was enlarged, and there was epithelioma of the cervix. On curetting the uterus evidence was obtained of the presence of cancer in the body. The uterus was too large to be removed whole through the narrow virginal vagina, the nature of the disease contra-indicated hemisection or morcellation; it was therefore removed entire *per abdomen*.

The specimen removed showed that the bulk of the organ was due to a fibro-myoma, one part of which had been attacked by cancerous growth similar to the cervical disease.

There was no direct extension of the cervical growth upwards into the body; the malignant disease in it may have been secondary to that of the cervix or an independent growth.

At any rate, it is clear that, while sarcoma may be considered as a not infrequent degeneration of the fibro-myomata, carcinoma and epithelioma are fortunately rare. This is just what would be expected from the abundant connective-tissue elements and the scarcity of the epithelial in the fibro-myomata.

COMPLICATIONS OF FIBROIDS, OR DISEASED CONDITIONS FOUND CO-EXISTING WITH FIBROIDS.

In the 100 cases under consideration there were found:

Cysts or cystomata of one ovary or both ovaries	in 23	cases.
Broad ligament cysts	in 2	,,
Thrombosis of veins of lower extremity before operation	in 2	,,
Varicose veins of pelvis	in 4	,,
Hydrosalpinx	in 4	,,
Pyosalpinx (double)	in 1	case.
Fibroma of Fallopian tube	in 1	,,
Papillomata of the appendages	in 1	,,
Adhesions to viscera	in 6	cases.
Incarceration of tumour	in 5	,,
Pregnancy	in 1	case.
Inflammation of appendix	in 1	,,
	51	cases.

The complications noted are all very ordinary ones, but they are sufficiently numerous and important to direct our careful attention to all cases of fibroid in which pain, rapid growth, or pressure symptoms are present.

Adhesions to viscera are due to peritonitis, however caused. Sometimes they occur after electrical treatment, or are due to extension of inflammation from the uterine appendages or an inflamed vermiform appendix. The case of pregnancy may be briefly noted:

CASE 74.—Mrs. M., aged thirty-eight. The lady had been married six months, the periods remained scanty and regular, lasting only two days. She had a period on December 2, 1900. On January 17, 1901, she consulted me, and complained of pain on the left side of the abdomen, much pain on defæcation, and a slowly increasing size of the abdomen. She also had had dyspepsia and much sickness for more than six months. On examination the abdomen was filled by a large lobulated tumour, from which the uterus could not be differentiated. The patient's friends refused hysterectomy, but desired oöphorectomy. They had been told that oöphorectomy would cause shrinking of the tumour, and relief from the dyspepsia and rectal pains. Shortly after this consultation patient had an ordinary, short, scanty, period, and on January 26 I removed the largest growth and both ovaries and tubes. The growth removed was sessile. On the fundus uteri it was larger than a fœtal head at term, and I hoped its ablation would diminish the pressure on the stomach. There was a large mass in Douglas's fossa, but it could not be removed unless the uterus were also sacrificed, and this the patient's advisers would not permit, on the ground that it was too dangerous an operation.

On the third day after operation, and within ten days of an apparently normal period, the patient miscarried. The fœtus appeared to be of about two months' development. The decidua came away entire, and was as large as it would usually be at three months' gestation. The patient had a normal pulse and temperature throughout, but suffered much from pain down the left thigh and leg, unaccompanied by any swelling. The con-

valescence was greatly hindered by this pain and by inability to walk. About a year later I heard from the lady's doctor that the tumour was increasing in size, and that she suffered much pain in the rectum about 4 inches above the anus. He said that on examination he could feel a mass pressing on this part. The periods remain scanty as before the operation.

In this case I wish I had refused to operate with my hands tied, because nothing but hysterectomy could really cure the patient. The myomectomy no doubt relieved the intra-abdominal pressure to some extent, and the miscarriage averted the necessity for hysterectomy before or at term. There would not have been space in the pelvis for the lower lobe of the tumour and a full-term fœtal head.

Some of the cases of incarceration of the tumour, or of a part of it in the pelvis, are sufficiently important to claim a brief notice. Case 55 has been already noted.

Case 58.—Mrs. B, aged forty-seven, no children. The existence of the fibroids had been long known to me and the patient, but her health was good, and no operation was thought of until she began to suffer from incapacitating pain in the right iliac fossa and the sacral region. She was free from pain when lying down, but directly she stood or walked the pain came on, and she then could not hold herself erect. On examination at these times a round mass could be felt behind and below the uterus. An effort was made to support the mass by various kinds of pessaries, but none was found which prevented the prolapse and consequent pain. Having seen several consultants, the patient decided that life in a recumbent position was unendurable, and she was relieved by operation. There were many outgrowths besides the one that had given trouble, and hysterectomy had to be performed.

In some such cases myomectomy is decidedly the operation for election.

The number of cases in which the ovaries had degenerated into cystomata, or were obviously diseased, is large—nearly one-quarter of the whole number.

It is, of course, possible to think that many cases of cystic disease of the ovaries come to a natural termination, and that the majority of the cases observed would have done so. On the other hand, in many of the cases the cysts had reached the size of an ordinary orange, and were not likely to subside spontaneously. These cases may have been simply instances of the coincidence of two common diseases, or, in some cases at least, the cysts of the ovary were probably due to interference with the pelvic circulation, and with the nutrition of the ovaries by the fibroids.

In several cases the fibroid growth, although growing from the side of the uterus, was contained between the folds of the broad ligament—Cases 12, 13, 30, 40, 48, 70, and 97. In Cases 12, 40, 48, and 70 it was possible to enucleate the tumour from between the folds of the broad ligament, to cut it away from the side of the

uterus, to mend the muscle of the uterus, and to cover in the raw surface with peritoneum so as to leave a useful uterus with one or both sets of appendages intact.

It may also be useful to mention that in the case of my youngest patient—F. K., aged eighteen—the uterus was uniformly enlarged. It was demonstrated by the sound that the tumour was in the anterior uterine wall. At the time of operation the flow of blood was checked by my colleague grasping the uterine arteries between her fingers and thumbs. I was then able to incise the anterior uterine wall, and with fingers and knife to turn the tumour out of the musculature. The cavity thus made was closed by layers of stitches, and the peritoneum was sewn together by Lembert's suture. The girl did very well, and went home on the twenty-sixth day. She has since then remained in excellent health and has normal menstruation. I have recounted this case and those of enucleation (or myomectomy) from the broad ligaments because, as we gradually improve technique and become exact in diagnosis, there will be an increasing number of cases in which we shall be able to remove the tumour and preserve the uterus and its appendages. One of my two oldest patients—M. P., single, aged sixty-eight—has already been described, but it is interesting to note that she had no less than three distinct degenerations—calcareous, cystic, and sarcomatous.

The other patient—Case 52, aged sixty-eight—had also both cystic and sarcomatous degeneration. The cases of sarcomatous degeneration, five in number, were aged respectively thirty-seven, forty-one, forty-five, sixty-eight and sixty-eight, giving an average age of fifty-two (approximately). The one case of invasion by carcinoma occurred in a woman aged sixty-one.

A table of the number of cases of fibro-myomata, with the ages of the patients, and a table showing the incidence of the several degenerations at different ages, are appended, also a complete table of all the cases on which this paper is founded.

AGES OF CASES IN WHICH DEGENERATIVE CHANGES WERE MET WITH IN OPERATION.

Œdematous and myxomatous	38, 31, 38, 41, 41
Cystic	40, 64, 41, 68, 68, 33
Sarcoma	41, 45, 68, 68, 37
Carcinoma	61
Necrotic	52
Sloughing	40, 42
Inflammation	38
Fatty	47
Calcareous	68, 59

AGES OF THE HUNDRED PATIENTS OPERATED ON FOR FIBRO-MYOMATA.

Age.	No. of Cases.
18	1
22	1
25	1
30	2
31	2
32	4
33	3
34	3
35	1
36	6
37	5
38	10
39	2
40	5
41	6
42	7
Carried forward	59

Age.	No. of Cases.
Brought forward	59
43	5
44	4
45	10
46	2
47	7
48	4
49	1
51	1
52	1
53	1
59	1
61	1
64	1
68	2
Total	100

No.	Name and Age.	Disease.	Operation.	Complications.	Degenerations.	Date.	Symptoms.	Remarks.	Result.
1	M. T., 45	Uninodular myoma	Oöphorectomy	—	—	26.7.92	Huge tumour	No better for operation	R.
2	Mrs. M., 40 (2 ch.)	Fibro-cystic myoma	Oöphorectomy	—	Cystic	15.9.92	Hæmorrhage; vomiting; pain; prostration	Cured	R.
3	Mrs. I., 47 (3 ch.)	Multinodular fibroid	Oöphorectomy	Ovarian cysts, cyst of broad ligament and duct of Gärtner	—	18.11.92	Floodings; anæmia; weakness	Cured	R.
4	Mrs. L., 42 (0 ch.)	Multinodular up to umbilicus and in pelvis	Abdominal hysterectomy	Left ovarian cyst	—	29.11.92	Abdominal pain; difficulty in defæcation	Cured	R.
5	Mrs. B., 48 (2 ch.)	Myoma	Myomectomy and hysterectomy	—	—	27.5.93	Large tumour; pain; hæmorrhage; dysuria	Tumour grew in front of uterus, which was also fibroid; died of shock	D.
6	J. G., 47	Multinodular	Myomectomy also oöphorectomy	—	—	9.6.93	Pain, etc.	—	R.
7	E. W., 48	Multinodular	Hysterectomy	Dense adhesions	—	8.8.93	Profuse hæmorrhage; wretched health	Electrolysis two years	R.
8	S. C., 30	Uninodular myoma	Hysterectomy	Adhesions from electrolysis; enlarged Fallopian tube	—	16.8.93	Agony; tumour; hæmorrhage profuse	Operation, paroöphorectomy, two years before; relieved; electrolysis; died of shock	D.
9	Mrs. M., 47 (0 ch.)	Multinodular	Hysterectomy	Varicose veins, pampiniform plexus	—	10.11.93	Profuse hæmorrhage and pain six years	Enormous fibroid distending whole abdomen	R.
10	Mrs. T., 32 (0 ch.)	Fibroma and double pyosalpinx	Oöphorectomy	Double pyosalpinx; very dense adhesions	—	21.11.93	Pain, hæmorrhage, and bad health	—	R.
11	Mrs. F., 38 (3 ch.)	Small fibroid uterus	Oöphorectomy	Papillomata of appendages	—	28.11.93	Much pain; metrorrhagia	—	R.
12	Mrs. C., 64 (0 ch.)	Fibroid growing from fundus and expanding left broad ligament	Myomectomy	—	Cystic	2.2.94	Prolapse; retention and incontinence; pain severe	9 lb.; felt cystic; loose-meshed fibroid, and few cells	R.
13	Mrs. C., 41 (0 ch.)	Fibroma of right broad ligament and of uterus	Hysterectomy	Cystic ovaries	—	26.1.94	Retention and incontinence six years	—	R.

No.	Name and Age.	Disease.	Operation.	Complications.	Degenerations.	Date.	Symptoms.	Remarks.	Result.
14	Miss L., 42	Multinodular	Hysterectomy	Left ovary cystic	—	8.2.94	Pain and rapid growth	—	R.
15	Mrs. S., 38 (1 ch.)	Multinodular	Hysterectomy	—	—	20.3.94	Abdominal pain, dysmenorrhœa, and dysuria	—	R.
16	C. T., 36	Multinodular	Hysterectomy	Cystic ovaries	—	17.4.94	Menorrhagia, metrorrhagia, ten years	—	R.
17	Mrs. T., 43 (0 ch.)	Uninodular	Hysterectomy	Cystic ovaries	—	19.6.94	Pain and difficulty in micturition; tumour; nerves	—	R.
18	E. B., 32	Multinodular growth in abdomen and uninodular in pelvis	Total hysterectomy; delivery of lower mass by midwifery forceps	—	—	24.7.94	Floodings and retention of urine	Infection spread upward from the incised perineum	D.
19	Miss D., 42	Multinodular fibroid	Abdominal hysterectomy	Ovaries and tubes enlarged and congested	—	27.7.94	Floodings and distress from size of tumour	—	R.
20	Mrs. B., 25 (1 ch.)	Soft uninodular fibroid	Abdominal hysterectomy	—	—	20.11.94	Hæmorrhage, tumour, breathlessness, dysuria, and retention of urine	Mistaken for ovarian cyst by competent observer	R.
21	Miss G., 43	Large soft uninodular fibroid	Total hysterectomy	—	—	27.12.94	Size and inconvenience interfering with work	—	R.
22	A. O., 38	Smooth uninodular fibroid	Abdominal hysterectomy	Right ovary cystic	Œdematous fibroid	26.2 95	Steadily-growing tumour; constant hæmorrhage	Mistaken by some observers for an ovarian cyst	R.
23	Mrs. T., 47 (0 ch.)	Multinodular fibroid	Abdominal hysterectomy	Both ovaries cystic; cysts containing blood	—	18.6.95	Incapacity for work; much pain; hæmorrhage	—	R.
24	Mrs. M., 48 (0 ch.)	Uninodular fibroid	Abdominal hysterectomy	Left ovary cystic	—	2.7.95	Hæmorrhage and pain; inconvenience from large tumour	—	R.
25	Mrs. B., 43 (1 ch.)	Multinodular fibroid	Hysterectomy	Double hydrosalpinx and cystic ovaries	—	5.11.95	Rapid growth of tumour; dysuria; profuse hæmorrhage	Died of hæmorrhage	D.
26	A. R., 22 (2 ch.)	Multinodular fibroid	Oöphorectomy	Varicose veins left broad ligament	—	17.12.95	—	—	R.
27	Ch. J., 35	Multinodular	Total hysterectomy	—	—	30.12.95	Profuse hæmorrhage; pain; retention and incontinence of urine; difficulty in defæcation	—	R.
28	Ch. S., 43	Multinodular	Total hysterectomy	Double hydrosalpinx	—	18.2.96	Rapid growth of tumour and constipation	—	R.
29	Mrs. R., 33 (0 ch.)	Uninodular	Hysterectomy	Adhesions to sigmoid flexure	—	3.3.96	Rapid growth; attacks of inflammation; retention of urine	—	R.

No.	Name and Age.	Disease.	Operation.	Complications.	Degenerations.	Date.	Symptoms.	Remarks.	Result.
30	Mrs. W., 36 (0 ch.)	Broad ligament fibroid; right wall uterus	Hysterectomy	Hydrosalpinx left tube; cyst of right ovary	—	29.12.96	Rapid growth of tumour; difficulty in micturition	—	R.
31	M. S., 31	Uninodular fibroid	Hysterectomy	—	Œdematous	1.6.97	Menorrhagia; pain; difficulty in micturition	—	R.
32	Mrs. G., 43 (3 ch.)	Multinodular fibroid	Hysterectomy	Hydrosalpinx and cystic ovary	—	24.6.97	Difficult micturition; increasing weakness	—	R.
33	Mrs. R., 38 (0 ch.)	Multinodular fibroids	Hysterectomy	—	Œdematous	29.6.97	Profuse periods; steady increase in tumour; dysuria	—	R.
34	Mrs. F., 40	Multinodular	Hysterectomy	—	—	16.7.97	—	—	R.
35	Miss S., 41	Fibro-cyst	Hysterectomy	Large cyst; curious twist of appendages; 54·5 oz. of fluid from cyst	Cystic sarcoma	1.10.97	Rapid increase of tumour and severe constipation	The tumour was hard, but when emptied of fluid looked like hardened brain substance	R.
36	Miss B, 38	Multinodular fibroids	Hysterectomy	—	—	—.10.97	Profuse hæmorrhage and bad health	—	R.
37	F. K., 18	Uninodular	Myomectomy	—	—	11.12.97	Hæmorrhage and pain	—	R.
38	Mrs. W., 39	Multinodular	Hysterectomy	—	—	10 2.98	Menorrhagia and pain	Ovaries intentionally preserved.	R.
39	Sister C., 37	Uninodular	Hysterectomy	—	—	5.5.98	Pain; foul discharge	—	R.
40	S. R., 36	Fibroid of left broad ligament and in uterus	Enucleation of broad ligament fibroid	—	—	27.5.98	Tenderness and pain left side of pelvis; cannot sit	—	R.
41	H. K., 53	Multinodular fibroid	Hysterectomy	—	—	3.6.98	Floodings; weakness; emaciation	—	R.
42	L. S., 41	Multinodular fibroid	Hysterectomy	Severe varicose veins of pelvis	Mucoid	24.6.98	Loss of flesh and strength; increased frequency of micturition	Large varicose vein slipped out of ligature	D.
43	Ch. McG., 44	Multinodular fibroid	Hysterectomy	—	—	29.6.98	Profuse periods and incapacitating pain	—	R.
44	M. B., 40	Multinodular fibroid	Abdominal hysterectomy	—	—	29.6.98	Pain; weakness; nervous disturbances; severe constipation	—	R.
45	Mrs. B., 45 (1 ch.)	Multinodular fibroid	—	—	—	26.10.98	Severe pain from prolapse of subperitoneal fibroid into pelvis	—	R.
46	M. McK., 30	Multinodular fibroid	Hysterectomy	—	—	30.10.98	Floodings; excessive anæmia	—	R.

No.	Name and Age.	Disease.	Operation.	Complications.	Degenerations.	Date.	Symptoms.	Remarks.	Result.
47	E. M., 47	Multinodular fibroid	Hysterectomy	Left ovarian cyst; fibroid of Fallopian tube size of walnut	—	12.11.98	Pain and profuse hæmorrhage 5 years	—	R.
48	M. A. W., 42	Uninodular fibroid opening up right broad ligament	Myomectomy	—	—	6.12.98	Pain and incapacity for work	—	R.
49	F. D., 45	Uninodular fibroid	Hysterectomy	Right ovary diseased; varicose veins in right broad ligament	—	15.2.99	Inconvenience from huge tumour; metrorrhagia every 14 days	—	R.
50	A. R., 42	Multinodular fibroid	Hysterectomy	Cyst behind uterus; adhesions to intestines	—	24.7.99	Size of abdomen	—	R.
51	Mrs. F., 45 (o ch.)	Uninodular fibroid	Hysterectomy	—	Interior of growth breaking down; sarcomatous	6.6.99	Irregular hæmorrhages; pain; loss of flesh and strength	Sarcomatous polypus found in cavity of uterus	R.
52	E. S., 68	Multinodular fibro-cyst	Hysterectomy	—	Cystic and sarcomatous	1.8.99	Large tumour; weight; œdema of legs; frequent micturition	Tumour grew very rapidly	R.
53	S. P., 34	Multinodular fibroids	Hysterectomy	—	—	30.10.99	Large tumour; incapacity for work	Rapid growth while under observation	R.
54	Mrs. M., 40 (4 ch.)	Multinodular fibroids	Hysterectomy	Cystic right ovary	—	27.10.99	Floodings	Operation *per vaginam* in August, 1899, for sloughing fibroid; in October, large fibroid submucous in anterior uterine wall	R.
55	M. P., 68	Multinodular fibroid	Hysterectomy	—	Cystic; calcareous; sarcomatous	9.2.00	Enormous tumour; loss of flesh; obstruction of bowels and bladder	Impaction of part of tumour in cavity of pelvis	R.
56	Mrs. H., 46	Multinodular fibroid	Myomectomy and oöphorectomy	Appendages on both sides diseased and adherent	—	27.2.00	Attack of pain in abdomen and back	—	R.
57	E. R., 41	Multinodular fibroid	Total hysterectomy	Small cysts in both broad ligaments	—	23.3.00	Repeated attacks of retention of urine; constipation; large tumour	—	R.

No.	Name and Age.	Disease.	Operation.	Complications.	Degenerations.	Date.	Symptoms.	Remarks.	Result.
58	Mrs. B., 47 (o ch)	Multinodular fibroids	Hysterectomy	—	—	28.3.00	Incapacitating attacks of pain in right iliac fossa and back	Uterus retroverted and with fibroid filling pelvis	R.
59	A. J., 36	Uninodular fibroids	Hysterectomy	Gall-stones	—	12.4.00	—	Sepsis	D.
60	M. B., 37	Multinodular fibroids	Hysterectomy	Cystic ovaries	—	4.5.00	Hæmorrhage	—	R.
61	Mrs. F., 49 (1 ch.)	Multinodular fibroids	Hysterectomy	Right ovary cystic and prolapsed between tumour and pelvis	—	10.5.00	Floodings and incontinence of urine	—	R.
62	M. B., 32	Uninodular fibroids	Hysterectomy	—	—	22.5.00	Pain; difficulty in micturition	—	R.
63	A. W., 38	Uninodular fibroids	Hysterectomy	—	—	2.6.00	Excessive loss; pain; increasing weakness; chronic invalid	—	R.
64	A. D., 34	Uninodular subperitoneal fibroid	Myomectomy and left oöphorectomy	Left ovary cystic	—	19.6.00	Pain and pressure on rectum	—	R.
65	Mrs. T., 32 (o ch.)	Uninodular subperitoneal fibroid	Myomectomy and right oöphorectomy	Right ovary cystic	—	22.6.00	Pain; prolapse of uterus; frequent micturition	—	R.
66	M. C., 45	Uninodular subperitoneal fibroid	Myomectomy	—	—	10.7.00	Much hæmorrhage; increased size of abdomen	Previously treated by electricity	R.
67	Mrs. M., 47 (o ch.)	Uninodular fibroid	Hysterectomy and left oöphorectomy	Left ovary cystic	Fatty and suppurative	18.9.00	Frequent profuse metrorrhagia; very feeble and blanched	—	R.
68	E. T., 61	Uninodular fibroid	Total hysterectomy	Cancer of cervix	Cancerous infiltration of fibroid	26.10.00	Metrorrhagia and foul discharge	—	R.
69	S. E., 41	Uninodular fibroid	Hysterectomy	Both ovaries cystic; size of large orange		15.12.00	Difficulty in micturition and defæcation; rapidly failing health	Death on sixteenth day (? sepsis)	D.
70	Miss C. S., 33	Fibroid of right broad ligament and multinodular of uterus	Myomectomy and ovariotomy	—	—	21.2.01	Pain and increasing incapacity for work	—	R.
71	A. R., 36	Uninodular fibroid	Hysterectomy	Cystic ovaries	—	18.1.01	Pain; excessive hæmorrhage; cystitis; emaciation	—	R.
72	Mrs. P., 31 (o ch.)	Uninodular fibroid	Hysterectomy; right ovariotomy	Right ovary cystic	—	22.2.01	Menorrhagia	—	R.
73	Mrs. P., 42	Multinodular	Hysterectomy	Right ovary cystic	—	14.6.01	Menorrhagia and pain; pressure on varicose veins	Severe varicose veins operation same time	R.
74	Mrs. M., 38	Multinodular fibroid	Myomectomy	Pregnancy	—	26.1.01	Large tumour; pressure on stomach; much sickness, etc.	—	R.

No.	Name and Age.	Disease.	Operation.	Complications.	Degenerations.	Date.	Symptoms.	Remarks.	Result.
75	J. W., 52	Uninodular fibroid	Total hysterectomy	—	Necrotic degeneration	30.3.01	Failing health; constant, moderate hæmorrhage; thrombosis veins of legs	—	R.
76	E. R., 38	Uninodular fibroid and appendicitis	Hysterectomy and appendectomy	—	Inflammation	25 4.01	Pain; hæmorrhage; rise of temperature and pulse-rate; intense sense of illness	Severe appendicitis about a month before operation	R.
77	J. B., 37	Uninodular fibroid	Hysterectomy	—	—	26.6.01	Pain; profuse periods	Fibroid incarcerated in pelvis	R.
78	Ch. L., 45	Uninodular fibroid	Hysterectomy	—	—	—	Progressive enlargement and pain	—	R.
79	E. T., 37	Uninodular fibroid	Hysterectomy; left oöphorectomy	—	Circumscribed patch of sarcomatous degeneration in tumour	12 7.01	Excessive menstruation	—	R.
80	Miss A., 48	Multinodular fibroid	Hysterectomy	—	—	1.12.01	Pain; large tumour; incapacity	—	R.
81	Mrs. F., 38 (o ch.)	Uninodular fibroid	Hysterectomy; right oöphorectomy	—	—	31 12.01	Pain; frequent periods	—	R.
82	Miss L., 44	Multinodular fibroids	Hysterectomy; right oöphorectomy	—	—	11.11.01	Pain and failing health	—	R.
83	E. P., 45	Multiple fibroids	Hysterectomy	—	—	31.12 01	Pain; tumour; hæmorrhage; dysuria	One tumour incarcerated; thrombosis of left leg 14 days; of right leg 33 days	R.
84	L. B., 59	Multiple fibroids	Hysterectomy	—	Calcification of upper part of tumour and detachment from rest	21.1.02	21 years' pain, and increase in size; bedridden 1 year; jaundice	Exploratory operation at another hospital	R.
85	M. F., 33	Uninodular fibroids	Hystereetomy and left öophorectomy	Diseased left ovary	Cystic	28.2.02	Pain; hæmorrhage; tumour	Incarceration of tumour in pelvis	R.
86	F. E., 45	Uninodular	Hysterectomy	—	—	14.7.02	Pain and failing health	—	R.
87	M. S., 41	Uninodular fibroid	Hysterectomy; left öorphorectomy	Cystic left ovary; varicose veins; left pampiniform plexus	Mucoid	15.8.02	Excessive loss 2 years and severe pain down right leg; totally incapacitated during attacks	Soft, loose-meshed spherical tumour inseparable from uterus; much mucoid fluid	R.

No.	Name and Age.	Disease.	Operation.	Complications.	Degenerations.	Date.	Symptoms.	Remarks.	Result.
88	Frau W., 45 (2 ch.)	Multinodular fibroids	Vaginal hysterectomy	—	—	14.8.95	Very profuse hæmorrhage 9 years; blanched	Curetted six times in Berlin	R.
89	M. C., 38	Multinodular fibroids	Vaginal hysterectomy	Epithelioma of cervix	—	19.11.95	Hæmorrhage	Fibroid in body of uterus; one 2·5 in. by 1·5 in. diameter	R.
90	C. T., 39	Uninodular fibroid	Vaginal hysterectomy	—	—	14.12.95	Hæmorrhage; pain; bed-ridden	—	R.
91	Mrs. W., 37 (0 ch.)	Uninodular fibroid	Vaginal hysterectomy	—	—	18.7.96	Hæmorrhage; pain; nausea; vomiting	—	R.
92	C. M., 45	Uninodular fibroid	Vaginal hysterectomy	—	—	23.10.96	Long-continued hæmorrhage; flooding 5 weeks	—	R.
93	Mrs. S., 51 (8 ch.)	Uninodular fibroid	Vaginal hysterectomy and ovariotomy	Infected cyst of left ovary	—	—.7.97	Long-continued and severe hæmorrhage	Infection from cyst, which burst during removal	R.
94	Mrs. L., 34	Uninodular fibroid	Vaginal hysterectomy and ovariotomy	Cyst of left ovary	—	10.8.97	Floodings	—	R.
95	Mrs. H., 44	Uninodular fibroid	Vaginal hysterectomy	—	—	27 5.98	Severe hæmorrhages 5 years; very feeble	Uterus was bisected to permit delivery	R.
96	Mrs. B., 46	Uninodular fibroid	Vaginal hysterectomy	—	—	17.6.99	Floodings 2½ years, unchecked by drugs and rest	—	R.
97	J. M., 36	Multinodular fibroids	Vaginal hysterectomy	—	—	—.10.99	Continued metrorrhagia and menorrhagia; incapacitated for work	Growth invaded both broad ligaments	R.
98	Mrs. H., 44	Sloughing fibroid	Morcellation	—	Sloughing	21.10 99	Hæmorrhage; foul discharge; septicæmia	—	D.
99	Mrs. M., 40 (4 ch.)	Sloughing fibroid	Morcellation	—	Sloughing	1899	Hæmorrhage; foul discharge	—	R.
100	Mrs. B., 42 (1 ch.)	Sloughing fibroid	Morcellation	—	Sloughing	21 10.99	Hæmorrhage; 4 years' foul discharge; septic	Developed septic symptoms	R.

ACARDIACUS ANCEPS.

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Origin and Development of Acardiaci.

The acardiaci or omphalosites might be logically included under the group of twin malformations. In all cases of double monostrosity there is, to begin with, one ovum the varieties in form and degree being determined by the extent and situation of the fission of the embryonal *Anlage*. When the splitting is complete and the two portions of the embryo go on to perfect development, there are born the so-called homologous or uniovular twins (Fig. 1, A). While in their autositic stage they can hardly be called monsters, and would probably themselves resent that title, yet their mode of origin is doubtless the same in kind as that of true double monsters. The parasitic varieties of uniovular twins occupy the realm of real monsters. Up to the twelfth day both the embryos develop evenly. At that time the allantois buds out from the hind-gut of each individual, and its vessels reach the placental portion of the chorion. Sometimes the allantoic vessels, and later on the placental vessels, of the twins anastomose very freely. One fœtus more vigorous may then overcome the force of the other's heart, which gradually ceases to act, so that the weaker fœtus gradually dies (Fig. 1, C). The increasing growth of the vigorous fœtus compresses the dead one, and finally squeezes it flat against the uterine wall, so that the *Fœtus papyraceus* results. When, however, anastomosis is not very free, and the inequality in the development of the two circulatory systems is not very marked, we have the condition which results in hydramnion (Fig. 1, B). If the force of the one heart exceeds the other, its more powerful blood-stream usurps a portion of the placenta of the other twin also. Because of the unusual extent of the placental area, the heart of the stronger fœtus undergoes further enlargement, and the renal secretion is thus augmented, causing an increase in the quantity of the liquor amnii of the stronger fœtus. A time comes when the increasingly hypertrophied heart of the stronger fœtus becomes incompetent. The result is congestion of the venous system, increased transudation into the amnion, and thus hydramnion.

In the case of true allantoic parasites, two healthy embryos develop from one ovum as in ordinary cases of homologous twins. The allantoic stalk of one may reach the inner surface of the primary

chorion a few hours or so before that of the other. It becomes attached to the chorion here, and begins to develop its umbilical vessels before the second allantois reaches the placental site. Therefore the allantois of the second embryo finds no chorionic attachment, or only a limited one, and is compelled to attach itself to the allantois of the first. There results an anastomosis of the umbilical vessels, and the first fœtus becomes dominant in the circulation. As the allantoic stalks become lengthened out into umbilical cords, the cord of the second may be attached to that of the first, at some distance from the placenta. It may be attached to the placenta close to that of the first, or the two may be connected by a large vessel upon the placenta. The anastomosing arteries will carry all, or nearly all, of the blood directly from the circulatory system of the first, without going through the placenta, into that of the second. The venous current, being slower, will not follow the line of least resistance so markedly. The second embryo thus gets arterial (*i.e.*, vitiated) blood from the first embryo's body. The pressure of blood from the heart of the first forces the current backward through the arteries of the second. The heart of the latter atrophies. The current is more direct from the umbilical arteries towards the lower part of the fœtus by way of the hypogastric arteries than towards the head. In fact, the hypogastric arteries become the important vessels of the parasitic fœtus. The organs normally receiving blood direct from the heart, such as lungs, head, liver, etc., become atrophied, or fail to develop at all. The distance from the heart of the autosite, which is the only pumping force in both fœtuses, is so great that the circulation is weak in the parasite's vascular system. On account of the stasis in the veins there are usually hypertrophy of the connective tissue, especially of the skin, and general œdema of the subcutaneous cellular tissues (Fig. 1, D and E).

Classification.

According to the degree of the development of the allantois and placenta of the second embryo, we get several varieties in acardiac fœtuses:

1. *Acardiacus anceps* is the least atrophied form, characterized by absence or non-development of face, the extreme anterior part of the body. There are rudiments of cranial bones and of the brain. It has more or less perfect trunk and extremities. It presents the transition to well-developed twins from one ovum. The species is rare.

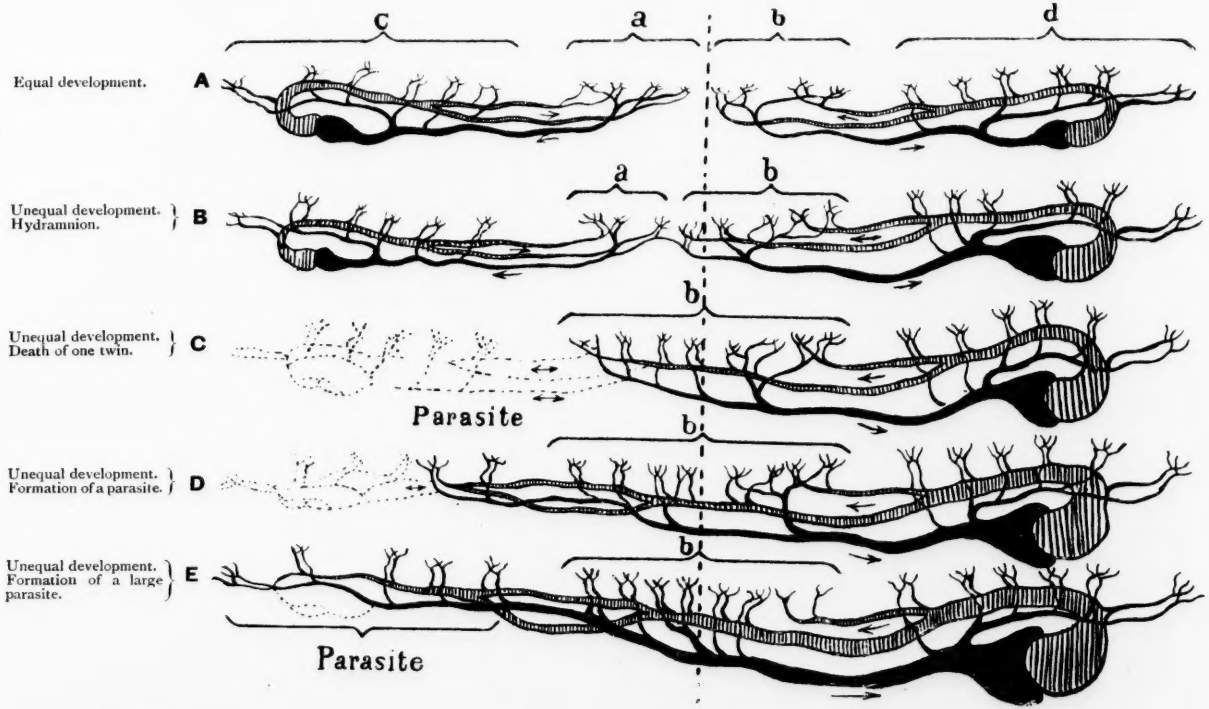

FIG. 1.—SCHEME OF EQUAL AND UNEQUAL DEVELOPMENT IN TWINS FROM ONE OVUM. (AFTER THOMA.)

c and *d*, Schematic representation of the circulatory apparatus of the two embryos with the placentæ, *a* and *b*; the heart represented very simply for the sake of clearness.

2. *A. acephalus* is the most common species. Head wanting, or very rudimentary. Intestines and abdominal organs rudimentary, and the organs above the diaphragm represented by the merest trace. Rarely more than a few vertebræ present, and these are usually of the lumbar or sacral type. Shoulder girdle undeveloped. Pelvis and lower extremities more nearly perfect.

3. *A. amorphus.*—Least developed. Little more than a lump of connective tissue, covered by œdematous skin. Sometimes a tract of hairy scalp is seen. Usually some attempt at budding out of limbs, though seldom with any systematic bony structure. There may be some rudiments of visceral tissue.

4. *A. acormus.*—Rarest. Head alone present, but never fully developed.

Clinical History of a Case under the Author's Observation.

The following is the clinical history of a patient from whom I was fortunate enough to secure a specimen of acardiacus anceps. A healthy Bengali lady, aged twenty-one, 5-para, 0 abortions, consulted Dr. S. N. Sen on May 14, 1901, for dyspnœa and palpitation. Her menstruation had ceased six months ago, and she had all the symptoms of pregnancy. At the end of the fourth month the abdomen began to increase in size rather rapidly, and at the end of the sixth month it was so big as to cause marked distress from pressure. When first seen by Dr. Sen, to whom I am indebted for the history of the case, the following conditions were noted: 'Uterus rather bigger than even at full-term pregnancy. Fœtal movements present. No fœtal heart sounds detected. Legs and feet œdematous. Pulse frequent. Respiration hurried.' On May 15 pains commenced. Dyspnœa and palpitation worse. Fœtal movements still felt. On the 16th pains continued irregular and ineffectual. No dilatation of the os uteri. No fœtal movements perceived from the evening. On the morning of the 17th os dilated about three fingers' breadth. Pains irregular and inefficient. Presentation could not be made out; only the tense bag of membranes felt. Patient was getting exhausted. The membranes were ruptured by the midwife in attendance, and a very large quantity of liquor amnii escaped. Both feet of a fœtus presented. I saw the patient at this stage. The presenting legs were blue, tense and œdematous. On gentle traction, the lower extremities of the fœtus, with the pelvis, gave way. The patient was at once put under chloroform and the uterus explored. The trunk of fœtus was delivered by hooking it with a finger, pushed

FIG. 2.

FIG. 3.

in easily through the tense œdematous skin. The finger felt as though passing through the pulp of a water-melon. No head was found. On putting my hand in the uterus again, another fœtus was detected and brought away. This was perfectly formed. The single placenta came out shortly afterwards. The subsequent progress was satisfactory.

Description of the Monster.

The torn parts of the monster were stitched up and photographed the next day, after being in formalin solution for more than twenty-four hours. Fig. 2 shows the monster stitched up, and Fig. 3 shows the abdominal and the potential thoracic cavity exposed by an anterior median incision.

External Appearances.—The monster measured 20·5 cm. from end to end. It was dark blue in colour, and markedly œdematous about the trunk. There was no indication of a head and face. Anteriorly there was a distinct crypt about 2 cm. below the cephalic end of the specimen. The crypt contained six tiny tubercles, three on either side, and some fine hair. These tubercles apparently indicated the fronto-nasal process, the maxillary process, and the mandible. The umbilical cord was attached about 4 cm. below the crypt. Penis and scrotum well developed. Right upper extremity 'trunk-hosed.' Breadth of the upper arm at axilla, 3 cm.; at the wrist, 1 cm. Right hand attached to forearm at a very acute angle. No thumb on right hand. Left arm comparatively slender, the hand containing five fingers, but the thumb diminutive. Lower extremities well developed, double talipes varus. *Trunk:* A median incision was made from below the crypt to the symphysis pubis. There was a fairly developed diaphragm separating the abdominal from the potential thoracic cavity. There was no true thoracic cavity, but the space between the ribs and diaphragm was occupied by loose embryonic tissue. No indication of lungs, œsophagus, etc. The abdomen contained some coils of small intestines. The rectum was fairly developed, and ended in a patent anus. No liver, spleen, or pancreas. Two lobulated kidneys. Bladder could not be distinctly made out, owing to the mutilation about its site. Two vessels, evidently the afferent and the efferent, could be traced from the umbilical cord. Immediately underneath the umbilicus, and attached to the umbilical cord for about 2·5 cm. by a thin band of fibrous tissue, was a small solid spindle-shaped muscular-looking tissue (? heart), about 5 mm. long and 3 mm. broad. The other end also had a thin fibrous cord, which was torn from its distal attachment. On making a transverse

section through this muscular spindle, a T-shaped slit could be made out, but no distinct cavity. *Osseous system* well developed, except the cranium. A very marked bend in the spinal column about the upper dorsal region. All the vertebræ and ribs present. The acromial ends of the clavicles touched each other in the middle line; the clavicles thus lay vertical and parallel to each other. The sternum was represented by a small piece of cartilage attached to the sternal ends of the clavicles. All the ribs tended towards this cartilage. What might be called the undeveloped cranium was attached to the cephalic end of the spinal column. It was 2 cm. long and 1·5 cm. broad, lined by dura mater. It had six distinct bones, representing, apparently, the supra-occipital and the basi-occipital in the middle, with two parietals and two temporals (squamosal and periotic) on each side. No other bones of the face or head were represented. The six tubercles above referred to were attached to a membrane connecting the parietals, temporals and the basi-occipital on the anterior aspect of this undeveloped cranium. It will thus be seen that development was arrested at the cephalic extremity of the monster. The structures derived from all the visceral arches were absent. The specimen thus clearly belonged to that very rare variety of acardiacus, the *Acardiacus anceps*. As far as I have been able to ascertain, this is the only specimen of acardiac monster in India.

A Review of Cases from Literature.

I append below a list of acardiac monsters from literature. Some kind of description was given in the first twenty-eight cases. In some of these a brief history of the mother was given too. Nos. 29 to 32 were merely mentioned. There were diagrams of the remaining thirteen cases. The tabulated cases might be reviewed under the following headings:

1. *Parity*.—Acardiacs are said to be rarely born in first labours (Geoffroy St. Hilaire). But of 10 cases in which the number of the pregnancy was noted 5 were primiparæ. So it is far from rare in first labours.

2. *Duration of pregnancy* was noted in 11 cases; in 6 it reached to full term.

3. *Birth of the Monster*.—The perfect twin is generally said to be born first. In 9 out of 11 cases the healthy twin was born first. Presentation was noted in 6 cases—2 by feet, 2 breech, and 2 cephalic end.

4. *Sex of the Monster*.—The sexes of the twins are identical. Dr. Dickinson's case, No. 14 in the list, is a doubtful exception.

TABLE OF ACARDIACI

(For Original Reports, see Corresponding

No.	Reported by	Mother.			Fœtus.		Description of the Monster.	
		Age.	Para.	Duration of Pregnancy.	First Born.	Second Born.	Head.	Thoracic Organs.
1	Harvey	—	—	—	—	—	Absent	Absent
2	—	—	—	—	Healthy	Monster	Indications of a mouth and of the auditory meatus	Absent
3	—	—	—	—	—	—	Partially developed cranium	Absent
4	R. Schofield	—	Multi-	—	Healthy (breech)	Monster (feet)	No cranial bones; facial bones tolerably developed; one large irregular opening represented nose and mouth; only one eye; eyelids present on both sides; no ears	Absent
5	F. Cookell, jun.	—	—	—	—	—	Absent	Absent
6	H. Ernest Trestrail (Alban Doran)	26	0	6 mo.	Healthy (feet)	Monster (cephalic end)	Absent	Absent
7	Alban Doran	—	—	—	—	—	Hairy scalp; distinct occipital bone; tympanic cavities present	Absent; pervious œsophagus
8	Alban Doran	—	—	—	—	—	—	—
9	Alban Doran	—	—	—	—	—	Represented by a knobbed proboscis	—
10	Alban Doran	—	—	—	—	—	Absent	—
11	Alban Doran	—	—	—	—	—	—	—
12	Alban Doran	—	—	—	—	—	Absent	—
13	Alban Doran	—	—	—	—	—	Absent	—
14	Alban Doran	—	0	9 mo.	Healthy (F.) (breech)	Monster (M?)	—	—

FROM LITERATURE.

Numbers in List of References.)

Description of the Monster—*Continued.*					Remarks.
Abdominal Organs.	Upper Extremities.	Lower Extremities.	Genito-Urinary Organs.	Classification.	
Intestines rudimentary; anus patent; no other organs	Absent	Large and well formed; varus. L. = 3 toes; R. = 5	External organs well marked (F.); no internal generative organs	Acephalus	? Two placentæ
Intestines rudimentary; no other organs	Absent	Two wartlike projections	A rudimentary kidney	Acephalus	—
Intestines rudimentary; (?) liver represented by a thick-walled sac	One projection only	One projection only	Bladder; ovaries	Acephalus	—
—	Absent	Imperfectly developed and œdematous; two toes in one, three in the other	No external genitals	Acephalus	Delivery difficult
No depression to indicate anus	R. represented by a short digit, L. by a thumb and little finger	Fairly developed; very œdematous; varus; toes deficient	Penis of fair size; no testicles	Acephalus	—
Intestines rudimentary; no upper abdominal viscera	Absent	L. fairly developed; four toes; varus. R. absent	One kidney; clitoris; no bladder, uterus or ovaries	Acephalus (monopus)	Hydramnion, Mus. R.C.S. 15
Stomach blind at pylorus; ¼ in. small intestine; a large intestine pervious at anus	Absent	Imperfect L.	Horseshoe kidney; bladder; sex not indicated; L. Wolffian body hypertrophied	Acephalus	Mylacephalus (Doran). R.C.S., 8, 9
—	L. rudimentary	Better formed	Male	Acephalus	R.C.S., 12
Intestines commenced as a blind sac in the cord, and terminated in an impervious rectum; no liver	R. ill-developed, ended in a single nail. L. absent	Present. R. three toes	Generative organs too imperfect to denote sex; horseshoe kidney, two ureters, and a bladder	Acephalus	R.C.S., 13, 14
A small portion of intestines only	Absent	Large, malformed; 'trunk-hosed'; defective toes; varus	Penis and scrotum well developed	Acephalus	St. Bart.'s, 3,435
—	L. phocomelous; fingers defective	Fairly formed; 'trunk-hosed'	Vulvar aperture distinct	Acephalus	St. Bart.'s, 3,435A
—	Absent	Fairly developed; varus; R. toes imperfect	Male organs well formed	Acephalus	St. Thomas's, LL. 21
—	Absent	'Trunk-hosed'; varus; three toes	F.	Acephalus	St. Thomas's, LL. 21[1]
—	Arms fairly developed	Legs and feet large	Male; external organs well formed (but see *Trans. Obstet. Soc. London*, vol. xxxi., 1889, p. 23.)	Acephalus	St. George's, 17D; Dr. Dickinson's case; *Medico-Chirurgical Transactions*, xlvi., 141, 1863

TABLE OF ACARDIACI

No.	Reported by	Mother.			Fœtus.		Description of the Monster.	
		Age.	Para.	Duration of Pregnancy.	First Born.	Second Born.	Head.	Thoracic Organs.
15	Alban Doran	—	—	6 mo.	—	—	Absent	—
16	Alban Doran	—	—	—	—	—	Absent	—
17	Alban Doran	—	—	—	—	—	—	—
18	Alban Doran	—	—	—	—	—	Soft mass represents the head ; tongue present	—
19	A. R. Simpson	20	2	9 mo.	Healthy	Monster	—	—
20	W. D. Slyman	—	2	6 mo.	Monster (breech)	Hydrocephalic, but otherwise normal (breech)	Absent	Heart represented by a solid mass roughly fashioned into the semblance of two rudimentary auricles and a single ventricle
21	Gibson Berkley and Amand Routh	—	Multi-	—	Monster	Healthy	Absent	—
22	G. Ernest Herman for G. Mallack Bluett	—	—	—	—	—	A circumscribed area covered with dark-brown hair appears to represent the scalp	—
23	H. Page	35	9	9 mo.	Healthy	Monster (cephalic end)	Absent	Heart rudimentary and single-chambered, in the common cavity of thorax and abdomen
24	W. H. Kelson	25	0	—	Healthy (vertex)	Monster (feet)	Absent	—
25	Dr. Grogono	22	0	9 mo.	Healthy	Monster	—	—
26	H. Bradbury (Alban Doran)	37	0	9 mo.	Healthy (vertex)	Monster (breech)	—	—
27	Arthur Keith	—	—	9 mo.	—	—	Skull in front of the coronal suture is almost undeveloped ; all the bones of the face absent ; indication of buccal cavity, a small conical tongue, eyeballs, and eyelids	Heart a very small three-chambered organ
28	Arthur Keith	—	—	5 mo.	—	—	—	—

FROM LITERATURE—*Continued.*

Description of the Monster—*Continued.*					Remarks.
Abdominal Organs.	Upper Extremities.	Lower Extremities.	Genito-urinary Organs.	Classification.	
—	Absent	—	Labia and clitoris well marked	Acephalus	St. George's, 23B
Intestines rudimentary	Absent	'Trunk-hosed'	Two kidneys (F.)	Acephalus	Guy's, 2,539[35]
Intestines rather long	L. phocomelous	'Trunk-hosed'	Two kidneys	Acephalus	London, O 79
—	R. absent. L. imperfect	'Trunk-hosed'; varus; toes imperfect	Two kidneys	Anceps	St. George's, 23A
Intestines rudimentary	—	R. foot=2 toes; L. two united, and another; varus	Absent	Acephalus	No hydramnion
Intestines well developed; spleen very small; no liver, stomach or pancreas	Absent	Well developed; L.=4 toes; R.=2	One large fused kidney with two ureters; testes, penis, scrotum present	Acephalus anceps (Doran)	Hydramnion; born naturally;
Intestines present	Absent	Fairly well developed	Two lobulated kidneys; bladder; external genitals fairly developed	Acephalus	Two placentæ
No trace of intestines; no solid organ	Absent	Absent	Absent	Amorphus	Mass of bone and cartilage bearing characters of a cervical vertebra; approached to the *acormus* type
No diaphragm; stomach present; no liver, spleen, pancreas, etc.	Absent	R.=2 toes; L.=4; talipes calcaneo-varus	Penis fairly formed; no scrotum proper; R. kidney; bladder; no testes	Anceps (Doran)	—
No liver, spleen, etc.	Absent	Ill-formed. R.=3 toes; L.=2	R. kidney; rudimentary external female organs	Acephalus	—
No anus	Misshapen R. hand, with 3 fingers attached to shoulder. L. absent	Feet deformed; one =3 toes, the other 1	No genital organs	Acephalus	—
Anus open	R. = 2 in. flat three-lobed piece of flesh. L. = minute nailed finger in a shallow pit	R. thin, single toe; L. 'trunk-hosed,' three toes	Penis well formed; scrotum rudimentary	Acephalus	—
Stomach and intestines fairly developed	Absent; represented only by the shoulder-girdle	Fused	No evidence of external genital organs; no bladder or urachus; both kidneys present	Acephalus (sympus)	? Anceps
Foregut and its derivatives absent; no liver, spleen, or pancreas; rectum normal	Absent	Fairly developed	Normally developed; suprarenal bodies very large	Acephalus	—

TABLE OF ACARDIACI

No.	Reported by	Mother.			Fœtus.		Description of the Monster.	
		Age.	Para.	Duration of Pregnancy.	First Born.	Second Born.	Head.	Thoracic Organs.
29	Alban Doran	—	—	—	—	—	—	—
30	M. Handfield-Jones	—	—	5 mo.	—	—	—	—
31	Sir James Simpson	—	—	—	—	—	—	—
32	A. R. Simpson	—	—	—	—	—	—	—
33	Lusk	—	—	—	—	—	—	—
34	Veendam	—	—	—	—	—	—	—
35	Charpentier	—	—	—	—	—	—	—
36	Poppel	—	—	—	—	—	—	—
37	Reisman and Hektoen	—	—	—	—	—	—	—
38	Barkow	—	—	—	—	—	—	—
39	Ahlfeld	—	—	—	—	—	—	—
40	Ahlfeld	—	—	—	—	—	—	—
41	Hirst and Piersol	—	—	—	—	—	—	—
42	Hirst and Piersol	—	—	—	—	—	—	—
43	Ahlfeld	—	—	—	—	—	—	—
44	Thoma	—	—	—	—	—	—	—
45	Thoma	—	—	—	—	—	—	—

5. *Hydramnion* is said to be usually present. The quantity of liquor amnii is noted in 3 cases only, in 2 of which it was abundant.

6. *Character of labour* is noted in only two cases, one difficult and the other natural. That dystocia may be caused by hydramnios and the peculiar conformation of the monster is evident from my case. Spiegelberg draws special attention to this point.

7. *Classification.*—All forms of acardiacs can be classed under one or other of the four varieties above referred to. Alban Doran thinks that a fifth variety—*A. mylacephalus*—conveniently includes certain cases. Case No. 6 in the list, which Doran at first classified under mylacephalus, has been grouped by him later on under *A. acephalus* (var. *monopus*). No. 7 in the list might similarly be included under *A. acephalus*. The classification would thus be a little simplified. Of the 45 cases, 37 were *Acephalus*, 3 *Acormus*, 2 *Amorphus*, and 3 *Anceps*. The classification of some of the cases might be reconsidered.

Teratogenesis.

Finally, a few remarks might be made with regard to the causation of monstrosities. The theory of the influence of maternal impressions causing malformations is quite untenable. Almost all the typical varieties of monsters have been produced experimentally

FROM LITERATURE—*Continued.*

Description of the Monster—*Continued.*					
Abdominal Organs.	Upper Extremities.	Lower Extremities.	Genito-Urinary Organs.	Classification.	Remarks.
—	—	—	—	Acephalus	Guy's, 2,539[40]
—	—	—	—	Acephalus	
—	—	—	—	Acephalus	Only mentioned.
—	—	—	—	Acephalus	
—	—	—	—	Acephalus	
—	—	—	—	Acephalus	
—	—	—	—	Acephalus	
—	—	—	—	Acephalus	
—	—	—	—	Acormus	
—	—	—	—	Acormus	Only diagrams
—	—	—	—	Acormus	
—	—	—	—	Acephalus	
—	—	—	—	Acephalus	
—	—	—	—	Amorphus	
—	—	—	—	Acephalus	
—	—	—	—	Anceps	

upon the eggs of birds and lower animals by the action of physical forces external to the embryo. For those still undetermined there is reason to believe that a rational cause will at some time be found. Mechanical hindrances—amniotic bands or adhesions—frequently arrest development, causing fœtal anomalies. Fission of the embryo is possible from mechanical force. O. Schultze produced double monsters by holding eggs between glass plates, and turning them at different angles during segmentation stage. Fish-eggs carried far in railroad cars and other vehicles, and therefore subjected to considerable shaking, show a much greater percentage of double formation than eggs hatched without such agitation. In mammals the splitting of the embryo is probably very often due to constriction of the zona pellucida. It may thus be seen that external conditions acting on the fœtus *in ûtero*, and internal conditions, inherent or induced in the fœtus itself, cause these malformations. In the small and delicate structures which form the early embryo, very slight and simple disturbances may interfere with the completion of parts. Thus, the influence of a blow on the abdomen, a fall or a violent movement, might extend through the uterine wall to the developing embryo. Arthur Keith suggests that inquiry into the condition of the mother during the weeks following conception might throw some light on the cause. But the patient will seldom take notice of trivial accidents

at such an early period, when she is as yet ignorant of the existence of pregnancy. I inquired very carefully about any abnormal condition in the early pregnancy in my case, and could get no information, as the patient failed to remember anything.

Specimen in the Madras Medical College.

Since writing the above, I have been favoured by Lieutenant-Colonel Sturmer, I.M.S., of Madras, with the particulars of a case of acardiac monster which is in the museum of the Madras Medical College. The specimen was found by Colonel Branfoot some years ago. It was one of a twin female birth, the other child was born alive and normally formed. There was a small tuft of hair and ill-developed bone in the centre of the mass, just above the point of entrance of the umbilical vessels. Below this was a small abdominal cavity, and above it the fœtal mass consisted of three cavities filled with serous fluid, and lined by a smooth membrane. A very curved and partially developed spinal column was found leading backwards and downwards from the position of the hairy tuft. There was no trace of heart, lungs, or brain; the abdominal organs were imperfectly developed. The lower limbs consisted mainly of a mass of low œdematous tissue. It was apparently of the acephalous variety. This, then, is the second specimen in India.

REFERENCES.

The Numbers refer to the Cases in the Tables.

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2 *British and Foreign Medico-Chirurgical Review*, 1860, vol. ii., p. 543.
3 *British Medical Journal*, 1879, vol. ii., p. 303.
4 *Trans. Obstet. Soc. Lond.*, vol. xxi.. 1879, p. 71.
5 *Ibid.*, vol. xxv., 1883, p. 110.
6 to 18 *Ibid.*, vol. xxxi., 1889, pp. 2-27.
19 'Contributions to Obstetrics and Gynæcology,' A. R. Simpson, 1880.
20 *Trans. Obstet. Soc. Lond.*, vol. xxxi., 1889, p. 258.
21 *Ibid.*, vol. xxxii., 1890, p. 347.
22 *Ibid.*, vol. xxxiv., 1892, p. 11.
23 to 24 *Ibid.*, vol. xxxiii., 1891, pp. 195, 302.
25 *Ibid.*, vol. xxxvi., 1894, p. 185.
26 *Ibid.*, vol. xxxvii., 1895, p. 209.
27 to 28 *Ibid.*, vol. xlii, 1900, p. 99.
29 *Ibid.*, vol. xxxi., 1889, p. 24.
30 *Ibid.*, vol. xxxiv.. 1892, p. 84.
31 to 32 'Contributions to Obstetrics and Gynæcology,' A. R. Simpson, 1880.
33 LUSK: 'Science and Art of Midwifery,' 4th edition, p. 558.
34 HIRST and MANN: 'System of Obstetrics and Gynæcology by American Authors,' vol. i., p. 299.

35 to 36 CHARPENTIER: 'Obstetrics,' vol. iii., pp. 304, 305.
37 RIESMANN and HEKTOEN: 'Pathology,' vol. i., p. 426.
38 to 42 JEWETT: 'Practice of Obstetrics,' p. 313 and Plates XIII., XIV.
43 to 45 THOMA: 'Text-book of General Pathology,' pp. 184, 185.

The following Works might be consulted:

HIRST and PIERSOL: 'Atlas of Human Monstrosities.'
BALLANTYNE: 'Diseases and Deformities of the Fœtus.'
FOERSTER: 'Die Missbildungen des Menschen.'
AHLFELD: 'Die Missbildungen des Menschen.'

THE ESTIMATION OF THE TRANSVERSE DIAMETER IN THE PARTURIENT WOMAN.

By ALFRED C. SANDSTEIN, M.D.

The obstetrician, in dealing with parturition, has three elements to consider—the powers, the passenger, and the passages. He can satisfy himself as to the condition of the powers, the passenger, and the *soft* parts of the passages, and he can gain a certain amount of information as to the bony passages; but it is here that a narrower limit bounds his knowledge, for the true pelvis, with which the processes of labour mainly concern themselves from the point of view of the difficulties of parturition, consisting of brim, cavity, and outlet, offers itself for investigation in the living subject almost entirely at its outlet and, to a lesser extent, in its cavity. That part through which the fœtal head has first to pass, which therefore offers resistance in the early part of parturition—namely, the inlet—is the furthest removed from the touch of the obstetrician. It is not entirely inaccessible, for we can touch the upper end of the symphysis pubis externally above the pubes, and the sacral promontory *per vaginam* through the posterior fornix. But, with these reservations, it is practically so, for the inlet is an ellipse, and in order to find out its condition its conjugate or antero-posterior and its transverse diameters must be known.

Now, the points that bound the true conjugate can be got at individually, the one *per vaginam*, the other suprapubically; but with our fingers alone the examining hand cannot touch both these points at the same time. Various pelvimeters, such as that of Skutsch, have been invented to overcome this difficulty, but none are in general use, if in use at all, and the obstetrician is compelled to rely on the relation between the diagonal and true conjugates as ascertained in the dead subject, and to apply it in practice to the living. The weakness of this is confessed by the recommendation to subtract $\frac{3}{4}$ inch instead of $\frac{1}{2}$ inch from the diagonal conjugate of a rickety flat pelvis to get its true conjugate.

The transverse diameter of the brim is in even a worse position, for, Skutsch's pelvimeter excepted, there has been no attempt made to ascertain its condition.

The transverse diameter has, of course, been measured in the pelvis of the dead subject, and given the length of 5 inches. It is certain that anything below this is abnormally small. Parvin* places it at 13·5 cm., about $5\frac{2}{5}$ inches. Playfair* gives it as $5\frac{1}{5}$ inches,

* *Vide* respective text-books.

and in twenty-eight cases taken at random in the post-mortem room I found that it averaged $5\frac{1}{16}$ inches. This is in a normal pelvis; but when we come to abnormal pelves the length of the diameter may be anything above or below this. We can, of course, guess whether the diameter is likely to be large or small in life from the size and general shape of the pelvis, but no accurate estimation has hitherto been possible in actual practice.

Importance of knowing the Length of Transverse Diameter.—It is a matter of no little importance, however, to know the length of the transverse diameter during life. Suppose two pelves, each flat rickety, and each with a conjugata vera of $3\frac{1}{4}$ inches. Here the treatment lies between forceps and version; but in the one case there may be a transverse diameter of $5\frac{1}{2}$ inches, and in the other only $4\frac{1}{2}$ inches. Obviously, as the head in version enters the brim in the transverse diameter, there would be much more room in the one case than in the other, so that, not only would it help in the decision between forceps and version, but in cases where we could determine the length of the transverse diameter it might decide us to perform embryulcia when the smallness of the transverse offered little chance of the delivery of a living child, rather than by a forcible extraction to injure the maternal passages.

Calculation of the Length of the Transverse Diameter in the Living Female.—The calculation of the length of the transverse diameter of the brim in the living subject is perfectly easy by a very simple mathematical calculation. All that has to be done is to measure the length of the intercristal diameter. This extends between the two widest apart points in the same transverse plane on the summits of the iliac crests. Divide the number thus got by two, and that represents the length of the transverse diameter of the brim in that particular pelvis. This very simple and easy measurement, and the simple process of dividing it into two, gives the transverse diameter, and that very closely. I was first led to make this observation during my experiments on symphysiotomy.* It occurred to me that it would be interesting to see if, in the twenty-eight pelves which I experimented on, in fresh cadavera and taken at random, there existed any fixed relation between those diameters which lay in the same plane as the transverse diameter of the brim, and the transverse diameter of the brim. These measurements were not made to test this relation, but after the measurements had been made for other purposes the idea simply came that it would be well to see if any such fixed relation did exist. On tabulating the inter-

* *Vide Journ. of Obstet. and Gyn. of Brit. Emp.*, March, 1902.

cristal, the intertrochanteric, the interspinous, and the transverse of brim, to my surprise the intercristal diameter averaged exactly double the transverse.

Original Cases 1 *to* 28.—I have tabulated these 28 cases at the beginning of my list of measurements in my thesis for the degree of M.D. The following table is the average length of these diameters in them, and shows the relation that exists:

Diameter.	Average Length in—	
	Inches.	Centimetres.
Intertrochanteric	11·3	28·7
Intercristal	10·1	25·7
Interspinous	8·8	22·5
Transverse (brim)	5·1	13·05

I may mention that all the measurements were made with Prochownik's callipers, lent me by Professor Simpson. In 22 cases the transverse diameter of brim exceeded half the intercristal by a range of $\frac{1}{50}$ inch (0·5 mm.) to $\frac{9}{10}$ inch (2·25 cm.), and in 6 cases it was less than half the intercristal diameter by a range of $\frac{2}{25}$ inch (0·2 cm.) to $\frac{3}{10}$ inch (0·75 cm.).

Relation between Transverse and Half Intercristal.

	Mean.	Average.
In 22 cases Tr.* *exceeded* $\frac{1}{2}$ I.C.† by	$\frac{3}{10}$ in., or 0·75 cm.	$\frac{7}{25}$ in., or 0·7 cm.
In 6 cases Tr. *was less than* $\frac{1}{2}$ I.C. by	$\frac{3}{10}$ in., or 0·75 cm.	$\frac{8}{25}$ in., or 0·8 cm.
In all the 28 cases the difference between Tr. and $\frac{1}{2}$ I.C. was ...	$\frac{3}{10}$ in., or 0·75 cm.	$\frac{8}{25}$ in., or 0·8 cm.

So that in these 28 cases the relation between the transverse diameter of the brim and half the intercristal diameter was correct to $\frac{3}{10}$ inch. In 18 of them the calculation would have been out only from about $\frac{1}{5}$ inch to $\frac{1}{50}$ inch. As this discovery was sufficiently exact and important to make me wish to carry the investigation further, I have done this.

But first of all I must acknowledge my indebtedness to Professor Simpson, not only for the use of instruments, but also for his great kindness in allowing me free access to all his museum specimens;

* Tr. means transverse diameter of brim. † I.C. means intercristal diameter.

and to Dr. Barbour and to Mr. C. W. Cathcart for similar kindnesses at their hands.

Further Investigations: Technique.—The instrument used by me was Prochownik's callipers, lent me by Professor Simpson. The advantages of these callipers lay in the exactness of the measurement to millimetres, and in the fact that by simply closing the handles to zero, swinging round the bar on the pivot thus formed at the end of the handles, and then crossing the arms, the internal diameters could be measured, reading now the scale from right to left. I tabulated my pelves in the chronological order of measurement, so that the number of each pelvis served as an index to it, and I measured the intercristal diameter twice, in the one case between the outer edges of the crests, and in the other between the summits of the crests. This at once established the fact that the intercristal diameter must be measured and considered as extending between the summits, and not the outer edges, of the iliac crests. The reasons for this are obvious: (1) Because the amount of projection of the outer lip of the iliac crest varies not with the pelvic capacity, but directly with the muscularity of the individual, and a muscular woman does not necessarily have a capacious pelvis; (2) because the outer lip of the iliac crest is a projection at right angles to the plane surface of the bone, and its extremity is not in the same plane as the extremity of the transverse diameter. The summit of the crest is, however, in the same plane.

Therefore, as the distance between the summits of the iliac crests varies with the form of the individual pelvis, and its extremities are in the same plane as those of the transverse diameter, it should be compared with the transverse diameter. My measurements established the fact that this is not to be ignored, for the difference is very great, and it must be remembered that the amount of error would be doubled, as it occurs on both sides of the pelvis.

If precaution is not taken against this, a small pelvis with a projecting outer lip would have, perhaps, nearly as large an intercristal diameter as a large pelvis with a small outer lip. For example, a justo-minor pelvis when measured between the outer lips of the crests had an intercristal diameter of 26·7 cm., a normal pelvis one of 27 cm., a difference of only 3 mm., whereas in reality the intercristal diameter of the justo-minor pelvis was very nearly 1 cm. less than the normal one, 25·6 cm. and 26·5 cm. respectively. This point must therefore be commended to the notice of practitioners; and in measuring with the callipers the points must lie on the summits of the crests, and not along their outer edges.

Arrangement of the Pelves into Groups.—As I have stated, the pelves

are arranged in chronological order first of all. Leaving out the first 28, which were measured in the post-mortem room, and which I have already discussed, there remain 84 pelves of different individual characters. These 84 pelves are classified below. The first line gives the mean and average amounts over all the 84 pelves by which the half intercristal differed from the transverse diameter, without reference to the direction of the deviation. The second gives the number of pelves out of these 84 in which the transverse exceeded half the intercristal diameter, and the average and mean amounts of that excess. The third gives the number of pelves in which the two figures exactly agreed, and the fourth the number in which the transverse was less than half the intercristal diameter, and the amount of that deficiency. (This arrangement I have also adopted in the table on p. 364.)

RELATION BETWEEN TRANSVERSE AND HALF INTERCRISTAL.

	No. of Cases.	Difference.	
		Mean.	Average.
In all the cases	84	3 mm.	4·9 mm.
Tr. greater than ½ I.C.*	in 43 of these	4 mm.	6·5 mm.
Tr.† equal to ½ I.C.	„ 10 „	—	—
Tr. less than ½ I.C.	„ 31 „	3 mm.	4·3 mm.

A glance at the preceding table shows how close is the correspondence between the two. But we must go further and make a still more minute classification :

	No. of Cases.	Difference.		Extent of Difference.
		Mean.	Average.	
In all the cases	84	3 mm. or $\frac{1}{8}$ in.	4·9 mm. or $\frac{1}{5}$ in.	From Tr. greater than ½ I.C.‡ by 2·35 cm. to Tr. less than ½ I.C. by 1·7 cm.
Tr. greater than ½ intercristal	in 1	—	—	By 2·35 cm.
Tr. greater than ½ intercristal	„ 7	1·15 cm. or $\frac{2}{5}$ in.	1·2 cm. or $\frac{2}{5}$ in.	By between 1 cm. and 2 cm.
Tr. greater than ½ intercristal	„ 35	0·4 cm. or $\frac{1}{6}$ in.	0·5 cm. or $\frac{1}{5}$ in.	By less than 1 cm.
Tr., equal to ½ intercristal	„ 10	—	—	—
Tr., less than ½ intercristal	„ 28	3 mm. or $\frac{2}{15}$ in.	3·4 mm. or $\frac{1}{7}$ in.	By less than 1 cm.
Tr., less than ½ intercristal	„ 3	1·15 cm. or $\frac{2}{3}$ in.	1·28 cm. or $\frac{2}{3}$ in.	By between 1 cm. and 2 cm.

* ½ I.C. abbreviation for half intercristal.

† Tr. abbreviation for transverse diameter.

‡ ½ I.C. abbreviation for half intercristal diameter.

In all the 84 cases the difference between the transverse diameter of the brim and half the intercristal diameter averaged only $\frac{1}{8}$ inch. The mean difference was $\frac{1}{8}$ inch. In 43 cases, or 51·3 per cent., the transverse diameter exceeded half the intercristal by a mean of $\frac{1}{6}$ inch, an average of $\frac{1}{4}$ inch. In 10 cases, or 12 per cent., the transverse diameter exactly equalled half the intercristal. In 31 cases, or 36·7 per cent., the transverse was less than half the intercristal.

Analysis of Cases with Transverse greater than Half Intercristal (51·3 *per Cent.*).—In the 43 cases, or 51·3 per cent. of all the cases, where the transverse exceeded half the intercristal diameter, in only one case (a small, markedly rickety, flat pelvis) was it by $\frac{1}{2}$ inch. In this case the difference was $\frac{4}{5}\frac{7}{0}$ inch. In 7 of the 43 cases, or about 17 per cent., it exceeded half the intercristal diameter by a mean of $\frac{2}{8}$ inch, an average of $\frac{2}{5}$ inch. In 35 of the 43 cases, or about 80·5 per cent., it exceeded half the intercristal diameter by a mean of $\frac{1}{8}$ inch, an average of $\frac{1}{5}$ inch.

Analysis of Cases with Transverse less than Half Intercristal (36·7 *per Cent.*).—In the 31 cases, or 36·7 per cent. of all the cases, in which the transverse diameter of the brim was less than half the intercristal, in 28 cases, or 90·3 per cent., the difference had a mean of $\frac{2}{1}\frac{2}{5}$ inch, an average of $\frac{1}{7}$ inch.

In 3 cases the difference had a mean of $\frac{2}{5}$ inch and an average of $\frac{2}{5}$ inch.

If we examine into the class of cases that compose these groups, we find that the closeness of the agreement does not depend on the class of pelvis. For different pelves of the same shape agree in varying degrees with the general rule that half the intercristal diameter equals the transverse diameter of the brim.

Having shown that in pelves taken at random there is a very fair degree of accuracy in estimating the transverse diameter of the brim, as equal to half the intercristal diameter, it can be shown that in pelves grouped according to their individual peculiarities the same calculation gives the same accuracy.

Of the 84 pelves, 11 were classed as normal in configuration, and in these the difference between half the intercristal diameter and the transverse averaged 4·5 mm. ($\frac{1}{5}$ inch); the mean difference was 3 mm. ($\frac{1}{7}$ inch). The transverse diameter of 5 of them exceeded half the intercristal by 8 mm. ($\frac{1}{3}$ inch both mean and average), of 2 exactly equalled it, and of 4 was less than it by an average of 2·2 mm. ($\frac{1}{11}$ inch), a mean of 2·25 mm. ($\frac{1}{11}$ inch).

Large Pelves.—Pelves which are well shaped but abnormally large in size numbered 10. In these 10 pelves the mean difference be-

tween the transverse and half the intercristal diameter was 3·2 mm. ($\frac{1}{8}$ inch); average difference 4·6 mm. ($\frac{1}{5}$ inch). Of these in 6 transverse diameter exceeded half the intercristal by a mean of 7·5 mm. ($\frac{3}{10}$ inch), an average of 6 mm. ($\frac{1}{4}$ inch). In 1 the transverse diameter equalled half the intercristal diameter exactly. In 3 the transverse was less than half the intercristal by a mean of 1·5 mm. ($\frac{3}{50}$ inch), an average of 2·3 mm. ($\frac{1}{12}$ inch).

Justo-minor Pelves.—Justo-minor pelves numbered 5. In these 5 pelves the mean difference between the transverse and half the intercristal diameter was 5 mm. ($\frac{1}{5}$ inch), and the average difference 3·8 mm. ($\frac{1}{6}$ inch). Of these, in 1 the transverse exceeded half the intercristal diameter by 1·5 mm. ($\frac{3}{50}$ inch); in 4 the transverse was less than half the intercristal diameter by a mean of 4·5 mm. ($\frac{1}{5}$ inch), and an average of 4 mm. ($\frac{1}{6}$ inch).

Funnel-shaped Pelves.—Funnel-shaped pelves numbered 11. In these 11 pelves the mean difference between transverse and half intercristal diameter was 3 mm. ($\frac{1}{7}$ inch), an average of 3·8 mm. ($\frac{1}{6}$ inch). Of these, in 5 the transverse diameter exceeded half the intercristal by a mean of 3 mm. ($\frac{1}{7}$ inch), an average of 4 mm. ($\frac{1}{6}$ inch). In 1 the transverse diameter equalled half the intercristal exactly; in 5 the transverse was less than half the intercristal by a mean of 2·5 mm. ($\frac{1}{15}$ inch), an average of 3·7 mm. ($\frac{1}{8}$ inch).

Obliquely-contracted Pelves.—Obliquely-contracted pelves numbered 12. In these the mean difference between the transverse and half the intercristal diameter was 5 mm. ($\frac{1}{5}$ inch), the average 6·6 mm. ($\frac{3}{11}$ inch). Of these, in 8 the transverse exceeded half the intercristal diameter by a mean of 6 mm. ($\frac{1}{4}$ inch), an average of 7 mm. ($\frac{1}{3}$ inch); in 1 the transverse diameter equalled half the intercristal diameter; in 3 the transverse diameter was less than half the intercristal by a mean of 4 mm. ($\frac{1}{6}$ inch), an average of 6·2 mm. ($\frac{1}{4}$ inch).

Transversely-contracted Pelves.—Pelves contracted in the transverse diameter numbered 3. One of these was a very small 'Roberts'' pelvis. Here the transverse was less than half the intercristal diameter by 1·7 cm., and was very small. In a second the difference was 6 mm., or $\frac{1}{4}$ inch, in favour of half the intercristal diameter. In the third the two were equal.

Rickety Pelves.—Rickety pelves numbered 23, and included many varieties, some markedly, some only slightly, rickety, and all classes of shapes. In these the mean difference between the two measurements was 3·5 mm. ($\frac{1}{7}$ inch), the average 4·6 mm. ($\frac{1}{5}$ inch). Of these, in 14 the transverse exceeded half the intercristal diameter by

a mean of 4 mm. ($\frac{1}{6}$ inch), an average of 5 mm. ($\frac{1}{5}$ inch). In 2 they were equal, and in 7 the transverse diameter was less than half the intercristal by a mean of 2·5 mm. ($\frac{1}{10}$ inch), and an average of 4·5 mm. ($\frac{1}{5}$ inch).

Unclassified Pelves.—Pelves which were not classified numbered 9. In these the mean difference between the two measurements was 2·5 mm. ($\frac{1}{10}$ inch), the average difference 3 mm. ($\frac{1}{8}$ inch). Of these, in 4 the transverse diameter exceeded half the intercristal by a mean of 2·5 mm. ($\frac{1}{10}$ inch), an average of 3·5 mm. ($\frac{1}{7}$ inch). In 2 they were equal, and in 3 the transverse was less than half the intercristal diameter by a mean of 4 mm. ($\frac{1}{6}$ inch), an average of 3·8 mm. (about $\frac{1}{6}$ inch).

From the preceding facts it will be seen that in each class of pelves there are some in which the transverse diameter does not quite equal the half of the intercristal, while in others it is more than equal to it, and in others, again, it is exactly equal to it. It is, however, quite certain that the variation from being exactly equal in the direction of either deficiency or excess is so slight as to scarcely disturb at all the value of the calculation, and for all practical purposes *we can perfectly well assume that the transverse diameter of the pelvic brim is to be got in any pelvis with fair accuracy by simply dividing the intercristal diameter by two.* Any deviation is so slight that it may be disregarded.

I cannot qualify this assumption, that the variation is to be disregarded in any way, more especially if we compare in the lists of pelvic measurements the accuracy of this calculation with that by which the true conjugate is usually calculated. The transverse diameter varied in length from half the intercristal by only a very few millimetres, or about $\frac{1}{5}$ inch. The true conjugate sticks no more closely to the rule of being $\frac{1}{2}$ inch less than the diagonal conjugate.

If in the 84 cases we make an average, it will be found that in them the difference between the conjugata vera and the conjugata diagonalis varied from being $\frac{1}{2}$ inch by an average of $\frac{1}{5}$ inch.

The following table, showing in each of the classes of pelves the closeness of the agreement with each of these rules, makes it evident that, if the general rule of subtraction of $\frac{1}{2}$ inch from the diagonal conjugate is a reliable method of calculating the length of the conjugata vera, subdivision of the intercristal diameter by 2 is an equally reliable method of arriving at the length of the transverse diameter of the pelvic brim. This is so, even if we merely express their relative accuracy in figures; but it is very evident that the rule

Pelves.	No.	Transverse and Intercristal.				No.	Conjugata Vera and Conjugata Diagonalis.			
		1*	2	3	4		1	2	3	4
All the pelves	84	$\frac{1}{5}$	—	—	—	80	$\frac{1}{5}$	—	—	—
Of these in	43	—	$\frac{1}{4}$	—	—	44	—	$\frac{1}{4}$	—	—
	10	—	—	0	—	4	—	—	0	—
	31	—	—	—	$\frac{1}{6}$	32	—	—	—	$\frac{1}{7}$
Normal pelves	11	$\frac{1}{5}$	—	—	—	10	$\frac{1}{7}$	—	—	—
Of these in	5	—	$\frac{1}{5}$	—	—	3	—	$\frac{1}{8}$	—	—
	2	—	—	0	—	0	—	—	—	—
	4	—	—	—	$\frac{1}{11}$	7	—	—	—	$\frac{1}{10}$
Large pelves	10	$\frac{1}{5}$	—	—	—	10	$\frac{1}{7}$	—	—	—
Of these in	6	—	$\frac{1}{4}$	—	—	3	—	$\frac{1}{5}$	—	—
	1	—	—	0	—	1	—	—	0	—
	3	—	—	—	$\frac{1}{12}$	6	—	—	—	$\frac{1}{8}$
Justo-minor pelves	5	$\frac{1}{6}$	—	—	—	5	$\frac{1}{8}$	—	—	—
Of these in	1	—	$\frac{3}{50}$	—	—	1	—	$\frac{1}{50}$	—	—
	4	—	—	—	$\frac{1}{6}$	4	—	—	—	$\frac{1}{7}$
Funnel-shaped pelves ...	11	$\frac{1}{6}$	—	—	—	11	$\frac{1}{5}$	—	—	—
Of these in	5	—	$\frac{1}{6}$	—	—	7	—	$\frac{1}{4}$	—	—
	1	—	—	0	—	0	—	—	—	—
	5	—	—	—	$\frac{1}{6}$	4	—	—	—	$\frac{1}{10}$
Obliquely-contracted pelves	12	$\frac{3}{11}$	—	—	—	12	$\frac{1}{9}$	—	—	—
Of these in	8	—	$\frac{1}{5}$	—	—	9	—	$\frac{1}{6}$	—	—
	1	—	—	0	—	0	—	—	—	—
	3	—	—	—	$\frac{1}{4}$	3	—	—	—	$\frac{1}{5}$
Transversely-contracted pelves	3	—	—	—	—	2	$\frac{1}{8}$	—	—	—
Of these in	1	—	—	0	—	1	—	$\frac{1}{12}$	—	—
	1	—	—	—	$\frac{1}{4}$	1	—	—	—	$\frac{1}{7}$
Rickety pelves	23	$\frac{1}{5}$	—	—	—	22	$\frac{1}{4}$	—	—	—
Of these in	14	—	$\frac{1}{5}$	—	—	16	—	$\frac{1}{4}$	—	—
	2	—	—	0	—	1	—	—	0	—
	7	—	—	—	$\frac{1}{5}$	5	—	—	—	$\frac{1}{10}$
Unclassified pelves	9	$\frac{1}{8}$	—	—	—	8	$\frac{1}{8}$	—	—	—
Of these in	4	—	$\frac{1}{7}$	—	—	4	—	$\frac{1}{12}$	—	—
	2	—	—	0	—	2	—	—	—	—
	3	—	—	—	$\frac{1}{6}$	2	—	—	—	$\frac{1}{4}$

relating to the transverse diameter of the brim is really a much more accurate actual method of arriving at the length of it than that

* NOTE.—Figures are *inches; averages* are given.

Column 1, average variation from the rule over all the cases without reference to direction of variation.

Column 2, average excess—in the one case of the transverse over half intercristal, in the other of difference between the conjugates over $\frac{1}{2}$ inch.

Column 3, exact bearing out of rule.

Column 4, as in Column 2, but being average deficiency—*i.e.*, amount by which the transverse is less than half intercristal, or true conjugate less than $\frac{1}{2}$ inch less than diagonal conjugate.

relating to the conjugata vera, because of the different methods of calculation.

The question now arises, Granted that this relation between the two diameters exists, why does it exist? It does not occur in the fœtal pelvis, where there is very little pelvic cavity, most of the adult pelvic viscera being in the fœtus abdominal; while, on the other hand, the false pelvis is expanded and flattened, and there is very little iliac fossa. In 10 fœtal pelves of different ages the transverse diameter was less than half the intercristal, in 6 by nearly $\frac{1}{2}$, $\frac{1}{2}$, $\frac{1}{3}$, $\frac{1}{3}$, $\frac{1}{5}$, and $\frac{3}{5}$ respectively, and in 4 by $2\frac{1}{2}$, $1\frac{2}{3}$, 5, and 3 times respectively its own length.

Again, in the pelvis of a human idiot of over thirty years of age, who never assumed the upright posture, it did not exist.

Therefore, it might be assumed that the relationship is due to forces working in extra-uterine life, and connected with the upright posture and ambulation, as it does not exist in the human fœtus, nor in quadrupeds, nor in the case mentioned of the human idiot. From various considerations, I incline to think that it may exist in order to favour balancing of the body during walking, in order to minimize muscular effort, but all such ideas must necessarily be quite theoretical.

REPEATED OVARIOTOMY.*

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The necessity for repeated ovariotomy in the same patient is somewhat rare. Of 228 cases of unilateral ovariotomy performed by Spencer Wells, recurrence in the presumably healthy ovary, necessitating a second operation, was noted in six cases; and of 300 cases collected by Pfannenstiel in the Breslau Klinik, six required a second ovariotomy.

Vellitz has collected 135 cases of repeated laparotomies for various causes, and in 56 of those the indication was cystic disease of the ovary, which was apparently healthy at the first operation.

The interval between the two operations varies, according to Olshausen, from six months to twenty-five years. Most are reported to have taken place within two years, although a much longer period has elapsed in some cases before the second operation was performed. Doran reports two cases of repeated ovariotomy, five and fourteen years after the first operation. Dr. Croom recently reported before this society a case where he removed a large dermoid cyst of the left ovary from a patient eighteen years of age. The right ovary, apparently healthy, was not removed. Eighteen months later the patient was readmitted to hospital on account of recurrent abdominal swelling, which proved, at a second operation, to be due to a papillomatous tumour of the right ovary.

It is of importance in considering the question of recurrent ovarian tumours to exclude those cases where the second tumour had its origin from ovarian tissue left in the pedicle, or from part of the cyst having been left behind at the original incomplete operation. The mortality from the second operation is slightly higher than the first, probably because of greater frequency of adhesions. Olshausen gives the mortality as 12 per cent., whilst Vellitz finds the mortality from the second operation to be as high as 26 per cent.

Repeated ovariotomy raises the interesting question: What is to be done with the apparently healthy ovary in cases of operation for unilateral cystic disease?

Previous to the recent researches upon the pathology of papillomatous ovarian tumours, more especially by Pfannenstiel and

* Read before the Edinburgh Obstetrical Society on June 11, 1902.

Williams, those cysts were regarded as forming one of the two great groups of ovarian cysts, and their exact clinical significance was a disputed question. Pfannenstiel shows that papillomatous growths may be associated with perfectly simple ovarian cysts, causing implantation and metastasis on the peritoneum, with ascites, the latter being permanently cured, in many cases, on the removal of the tumour. On the other hand, of cystic carcinomas of the ovary he finds one-half papillary in nature, giving rise to true metastasis in the glands, liver, and other organs. It is, therefore, in the case of papillary cysts that the removal, partial or complete, of the other ovary is of most importance, because it is difficult or impossible during the course of an operation to say with any degree of certainty whether we are dealing with a simple or malignant papillomatous tumour. It is imperative for the operator to inform the patient before operation that the other ovary may at the same time have to be removed. This is specially necessary with patients at the child-bearing period. In women at or about the climacteric it would probably be a safe rule to remove the unaffected ovary in every case. In younger patients we have to consider the relative advantages of leaving the ovary, removing it altogether, or partially excising it. By leaving the ovary the absence of the distressing symptoms associated with an artificial menopause, and the possibility of subsequent pregnancy taking place, have to be contrasted with the slight risk which the patient runs of a repeated ovariotomy. According to the statistics of Spencer Wells, only in 2·6 per cent. of unilateral ovariotomies is the repeated operation necessary. Of 228 ovariotomies performed by him, 120 of the patients subsequently bore children, and only in six cases, as already mentioned, was a second ovariotomy called for. If our patients could be kept under observation after operation, so that early manifestations of recurrence could be detected, there would not be the same danger in leaving the unaffected ovary. But in the case more especially of papillomatous tumours the recurrent growths spread so rapidly that by the time the patients come under observation operation is frequently useless. Veit has reported such a case where a papillomatous ovarian tumour was removed. Nine months later recurrence took place in the opposite ovary, necessitating a second difficult operation. When the ovary shows incipient cystic disease, simple puncture with the knife or cautery, as first performed by Spencer Wells and later by Schroeder and Martin, may be sufficient. Of ten cases of incipient cystic disease so treated by Martin during the course of a unilateral ovariotomy, three of the patients subsequently became pregnant,

and in no case was a second operation required for recurrent cystic disease. In small adenomatous and dermoid cysts, resection of the ovary has the advantage in younger patients of probably removing the disease and at the same time leaving sufficient ovarian tissue to permit of ovulation and subsequent pregnancy. Mathai reports from Olshausen's Klinik six cases of pregnancy following partial resection of dermoid cysts. Mere resection of a papillary cyst is not so safe. Odehman recently published a case where a large papillomatous cyst was removed from the left side. The right ovary showed incipient papillomatous disease, and was only resected. The disease recurred in this ovary, and when the patient came under observation complete removal of the affected parts was impossible. Pfannenstiel, writing on this subject, states that in all cases of ovarian tumours, which have a tendency to become bilateral—for example, carcinoma, sarcoma, and papillomatous tumours—and in all forms of tumours in patients over forty years of age—the other ovary must be removed at the same time. The three following cases are of collective interest from the fact that in each, within a period of two and a half years, a second ovariotomy was necessary for the removal of a cystic swelling of the ovary, which at the time of the first operation was apparently sufficiently healthy to warrant its being left behind. Individually they are of interest as illustrating recurrence in each case of a different type of tumour.

Case 1.—Mrs. J., forty years of age, came under my care in the summer of 1898, complaining of pain and abdominal swelling of four months' duration. She had been married twenty-one years; never pregnant; menstruation regular. On examination there was dulness on percussion over the left lower quadrant of the abdomen, reaching as high as the umbilicus. The uterus was small and retroverted. Diagnosis was left-sided ovarian cyst. Ovariotomy being performed, the tumour proved to be a left-sided multilocular cyst. The pedicle was a long one, and was ligatured in the usual way. Beyond some few adhesions to the abdominal wall, the operation was uncomplicated. The right ovary was felt, but not specially inspected, and, as it did not appear to be enlarged, it was not removed. Her recovery was satisfactory. She enjoyed excellent health for the following two years, but again consulted me on December 5, 1900, two years and a half after operation. She now complained of pain and swelling on the right side of the abdomen, gradually increasing for some months previous to being seen. She had a ventral hernia, for which she was chloroformed, with a view of curing it, when a swelling the size of a cocoa-nut was felt to the right of the uterus. This proved to be a simple multilocular ovarian cyst connected with the right ovary. There were no adhesions, the pedicle was secured in the usual way, and the abdominal wound sutured for the relief of the hernia. Two days after operation her temperature rose to 101·8°, pulse 124. She complained of pain in the back and over the right scapula, with rapid and painful breathing and blood-tinged sputum. There was dulness over the lower half of the right chest behind. Ten days later the temperature and

pulse were normal, and the pneumonic symptoms had subsided. After that she made an uneventful recovery, and was dismissed cured one month after admission to hospital.

Case 2.—Mrs. R., thirty-four years of age, consulted me in July, 1899, on account of pain and swelling of the left side of the abdomen of two months' duration. She considered herself four months pregnant. The pain over the swelling was very severe and continuous for a fortnight before her admission to hospital. Her previous health had been good, and she had had three natural full-time confinements. On examination there was felt a cystic swelling the size of a football, and extremely tender to pressure. To the right of the tumour, and reaching as high as a hand's breadth above the symphysis, there was felt a soft swelling, corresponding in size to a four and a half months' pregnant uterus. The diagnosis was four and a half months' pregnancy, complicated with an ovarian cyst. On July 20 ovariotomy was performed. The tumour was found to be a left-sided ovarian cyst, chiefly unilocular, and covered upon its inner wall with abundant papillary growths. There was some localized peritonitis over the tumour, which probably accounted for the pain complained of previous to operation. The pedicle, which was twisted, was ligatured in the usual way, and, as the right ovary appeared to be perfectly normal, it was not removed. On August 19 she was dismissed well. She continued in good health, and had a normal confinement on December 22, forceps being applied at the outlet. She nursed for a few weeks only, and menstruation was subsequently somewhat irregular. On October 15, 1900, fifteen months after operation, she was readmitted on account of dysuria of five weeks' duration. On examination, the abdominal cicatrix retained its dark pigmentation acquired during the later months of pregnancy. The uterus was normal in size, and was pushed to the front and left side by a cystic swelling the size of a child's head, occupying the right and posterior fornix. Diagnosis was ovarian cyst of the right ovary. On October 18 vaginal ovariotomy was performed, and a unilocular papillomatous cyst was removed. The vaginal route was chosen in this case in preference to a repeated abdominal section, on account of the position, size, and mobility of the tumour. She was dismissed well on November 7.

Case 3.—J. A., thirty-two years of age, was admitted to hospital on March 16, 1900, complaining of swelling of abdomen of five months' duration. Menstruation regular; never pregnant. On examination the abdomen was found occupied by a tense cystic swelling, corresponding in size to a full-time pregnancy. *Per vaginam* no bulging was found in either lateral fornix, but the lower edge of the tumour could be felt through the anterior fornix on pushing it from above. On March 26 ovariotomy was performed for a tumour having all the appearances of a simple multilocular ovarian cyst. The pedicle was secured in the usual way, and, as there were universal adhesions to the peritoneum, the abdominal cavity was irrigated with sterilized water. The right ovary appeared to be unaffected. On April 1 there were noted signs of pleurisy with effusion over the base of the left chest behind. The chest signs cleared up in the course of a fortnight, and the subsequent progress of the patient was quite satisfactory. She enjoyed good health, and was able to attend her work in a mill for a continuous period of nine months. She was readmitted to my ward on November 20 of last year (a year and nine months after operation) complaining of abdominal swelling of two and a half months' duration, the increase being specially marked during three weeks previous to admission. Menstruation had been irregular since the first operation. On examination the patient was found anæmic and somewhat emaciated, temperature 101°, pulse 120. There was found a semi-cystic abdominal swelling, nodular in parts, and rising in the middle line as high as a hand-breadth above the umbilicus. There was complete

dulness in both iliac regions, and great pain complained of in palpating the tumour. The uterus was retroverted, the sound passed ½ inch beyond the normal, and through the anterior fornix the lower edge of the tumour could be felt. The circumference of the umbilicus was 36½ inches. The chest appeared to be normal, and the urine was free of albumen. Diagnosis was right-sided ovarian tumour, probably malignant. On November 26 ovariotomy was performed, and there was found a large quantity of blood-tinged ascitic fluid in the abdomen. The soft friable tumour, somewhat adherent posteriorly, was removed through a long abdominal incision. There was no trace of the left ovary. There was felt a nodule the size of a walnut upon the parietal peritoneum, and two smaller ones on the fundus of the uterus. The patient made a perfectly satisfactory recovery from the operation, but the abdominal pain complained of before operation continued uninterruptedly. This was referred chiefly to the peritoneal growth, which increased rapidly in size. A month after operation she had continuous sickness and vomiting, and she died with all the symptoms of peritoneal cancer two months later. No post-mortem was obtained.

Of the three cases which I have reported, the first may be looked upon as a coincidence, both tumours being multilocular and simple in nature. Incipient cystic disease may have been present in the ovary which was left at the first operation, where simple puncture might have prevented further growth; but from the age of the patient its complete removal would, I think, have been justifiable. The second case favours Pfannenstiel's suggestion that in all papillomatous ovarian cysts, irrespective of the age of the patient, the other ovary should be removed, although apparently unaffected, on account of the suspicious nature of those tumours, and their great tendency to bilateral growth. The third case is of special interest over and above the other two, because of its bearing on the subject of the relation of proliferating cystomata of the ovary with cancerous disease of other abdominal organs. In the Edinburgh Hospital Reports, 1892, Professor Simpson, writing upon this subject, reports a case of double ovariotomy for simple multilocular cystomata, associated with carcinoma of the liver. He refers to the statistics of Spencer Wells, who found that of 1,000 ovariotomies, where 117 of the patients had died after recovery from the operation, thirty-two succumbed to malignant disease at an interval of from six weeks to five years after operation. Various explanations have been suggested to account for the greater tendency such patients have to become the subject of malignant disease. Professor Simpson drew attention to the greater liability to subsequent cancer after double as contrasted with unilateral ovariotomy, and from this fact he suggests that some cases might be accounted for by the absence of healthy ovarian products in the system, or to the presence of morbid products entering the circulation from the degenerated organs.

Olshausen gives two alternatives for this tendency. 'Either,' he says, 'we have to do in the affected cases with a mixed tumour, there being carcinomatous parts present in what appears to be a simple proliferating cyst, or the ovarian tumour was only a myxoid cystoma, but its extirpation gave rise to the carcinoma from some of the epithelial cells of the adenoma having been allowed to remain or fall into the peritoneal cavity. In the latter case these epithelial elements took root in the peritoneum, and were there nourished and developed into carcinomata.'

Pfannenstiel believes that many cases of carcinoma of abdominal organs following on the removal of ovarian tumours are independent of such growth, and are to be accounted for rather by a pre-existing cancerous diathesis. As illustrating this he describes two cases: one where carcinoma of both breasts developed after simple lateral ovariotomy, and one of carcinoma of the stomach occurring a year and four months after the removal of a double papillomatous ovarian tumour.

In the case I report the first tumour, which was removed, appeared to be an ordinary multilocular ovarian cystoma, and in the absence of any suspicion of malignant disease in the abdomen, it was not examined microscopically; nevertheless, it may have contained malignant elements. The cyst which was removed a year and nine months later from the other ovary had also the appearance of a multilocular ovarian cystoma, and microscopic examination of it by Professor Sutherland failed to reveal any cancerous appearances.

Associated with this there were, however, cancerous nodules on the parietal and visceral peritoneum. The origin of these may have been undetected carcinomatous elements in the first tumour removed, or the case may support the suggestion of Professor Simpson that the absence of ovarian products is an element of importance in the causation of abdominal cancer after double ovariotomy.

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OBSERVATIONS ON THE FIRST STAGE OF LABOUR: ITS CAUSAL RELATION TO UTERINE RUPTURE.

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The first stage of labour can correctly be stated to comprise the period in which the os is in process of dilatation; its beginning is not so easily indicated, nor has its ending been defined with precision. Dr. Berry Hart has pointed out the futility of considering painful contractions of the uterus as indicative of its commencement. A uterine contraction without pain is certainly no indication, nor yet can the presence of a show—*i.e.*, blood-stained mucous discharge—with accuracy be said to mark its origin. Again, cervical dilatation is of no reliable significance, for a patulous canal is not infrequently present long before labour begins. It seems to me that an accurate definition of the commencement of labour must take cognizance of that peculiar phenomenon known as uterine polarity. If this be so, then a contraction of the body of the uterus, accompanied by a relaxation of the circular fibres in the cervix, the processes being interdependent, will mark the commencement of labour.

The occurrence of uterine polarity does not seem to have received any sufficiently reasonable explanation; the one I now offer has, at all events, the merit of simplicity.

The arteries, veins, and nerves which pass through the lower uterine segment must be subjected to a considerable amount of stretching force during the sudden increase of its area, brought about by a labour contraction. That the circulation suffers is evidenced by the serous infiltration and softening of the cervix, a result of impeded venous return. Hence congestion occasionally terminates in rupture of the vessels and the formation of a cervical hæmatoma. In a similar manner there seems little doubt that the nerves must be affected. Nerve impulses are easily inhibited by the over-stretching of a nerve, and when once this takes place a paresis of the circular muscle fibres in the cervix to which these nerves are distributed will occur. A consideration of these views makes the etiology of uterine polarity quite understandable, and affords us a scientific basis for determining the onset of labour.

If we now turn to the ending of the first stage of labour, I find myself in sharp disagreement with the generally received definition of it—viz., that it terminates when the os is fully dilated. It is in my opinion erroneously held that a fully dilated os is at all times capable of permitting the passage of the fœtus through it. Abundant evidence is forthcoming to show that this is not so. Our dispensaries teem with patients suffering from torn cervices, the result of so-called normal delivery. Some of these, no doubt, may fairly be considered to result from misdirected efforts on the part of the attendant to hasten delivery, but a large number still remain that cannot be accounted for in this manner. These are the cases in which the first stage of labour has not ended on the full dilatation of the os, but rather at the time of the tearing of the os to permit of the passage of the fœtus through it. This condition, induced by tension, may be more readily understood if we call to mind the somewhat analogous process which is observable in phimosis. If the blades of a forceps are pushed through the orifice of a phimosed prepuce, and then opened with force so as to bring about full expansion of the ring, we find that it assumes hard and rigid characteristics, with a knife-like, unyielding edge. Similarly, the os stretched to its fullest expansion becomes knife-edged, with thin, unyielding walls, and we speak of the condition as 'rigidity of the os.' When once the os has reached this stage of expansion it tears with the greatest facility, either spontaneously or in consequence of manipulations, carried out, perhaps, in the gentlest manner possible. This rupture, moreover, is hard to recognise as such by the fingers of the examining hand even during the process of its occurrence. An apparently very rapid dilatation is felt resembling closely the sudden relaxation of a spasmodic stricture. It is probable that in this way arose the erroneous notion that a rigid os is the result of a muscular spasm. A moment's thought will demonstrate the untenability of such a theory. The fact that in spite of this so-called muscular spasm the os remains open, though the function of the contracting muscle is to cause its closure, is sufficient to show the impossibility of associating in any causal connection the conditions one with the other. There seems little reason to doubt that a rigidity such as I have described indicates an expansion of the os to its utmost limit, short of a solution of continuity taking place. An os in this state, incapable of further expansion, is still subjected to the pull of the uterine contractions throughout its entire circumference. These contractions are not equally effective in all directions. In the tug of war that takes place between them, the posterior fibres gain the mastery of the others, the

result being that the posterior cervical lip is taken completely up and becomes continuous with the post-vaginal wall. If the os cannot expand, it is evident that it must follow in the wake of the disappearing posterior cervical lip, and thus we find it moving in a direction upwards and backwards, dragging in its progress the anterior cervical ip after it, and causing that structure, in common with the anterior lower uterine segment, to thin out more and more. This thinning, brought about as just described, is at times so extensive that it closely simulates unruptured membranes, and may give the mistaken impression that the os is fully open. I have even known an attempt to be made to apply forceps under such circumstances. A cervix drawn out and thinned in this manner is erroneously said to be incarcerated, or nipped between the pubes and presenting part of the fœtus, and thus its inability to retract is accounted for. It is highly improbable that nipping of the cervix between the smooth pubic walls and the equally smooth fœtus is, under the conditions generally present, possible. Moreover, were it so incarcerated its liberation would be attended with infinitely greater difficulty than is experienced in the manipulation ordinarily advised for effecting this purpose. This manipulation not infrequently results in the tearing of the cervix.

If these views are accepted, it becomes at once evident that the ending of the first stage of labour cannot without exception be defined as occurring when the os is fully dilated. The elongated anterior cervical lip set free by rupture becomes rapidly œdematous during the further progress of labour, and is occasionally found protruding through the vulva after delivery.

It is extraordinary to note the slight extent to which this complication has arrested the attention of obstetricians. It has been wrongly described as a hæmatoma of the cervix, and I have known of one instance in which it was torn from its attachments, under the mistaken impression that a portion of adherent placenta was being dealt with.

So far I have described rigidity of the os and the events which follow from it in cases of primiparæ. In them the infra-vaginal cervix is the weakest portion of the uterus, and its readiness to tear lessens the liability of the organ to rupture elsewhere.

In multiparæ, on the other hand, the deposition of fibrous tissue in the neighbourhood of old lacerations often renders the cervix exceedingly tough and inelastic, and thus interferes with its dilatation. Under these circumstances we have as a result of this moving upwards and backwards of the os great thinning of the anterior

cervical lip. This lip will be formed by the anterior fornix of the vagina below and the anterior lower uterine segment above, the two structures lying one on top of the other. In the event of the os neither dilating nor yet tearing, a rupture of the lower uterine segment and vaginal vault is very likely to occur as they become more and more thinned out by the pressure downwards exerted on them by the presenting portion of the fœtus and the counter forces exerted by uterine muscles at either side. Occasionally, however, it is the posterior fornix and posterior lower uterine segment that are torn. This can be explained by remembering that the uterine and posterior vaginal walls become continuous after the taking up of the cervical lip. The uterus thus may drag itself free from the vagina, the tear being continued into the cervix and up the lateral walls of the uterus.

It is a curious fact that three-fourths of uterine ruptures which have been reported as occurring in Dublin within the past ten years were complicated by vaginal tears, while such ruptures are by no means the kind most commonly met with elsewhere, as all statistics show. Another point of interest in connection with our Dublin cases arises from the insidious method of their occurrence. Observer after observer has noted that in many instances the catastrophe was not preceded by signs which we are taught to associate with impending rupture. Moreover, it is in those cases in which the vaginal tear complicated the rupture that an absence of premonitory symptoms was noted. In consequence of the rarity of pelvic contraction amongst us, uterine rupture is not often encountered. The cases reported favour the belief that rupture takes place not often as a complication of the second stage of labour, but of the first.

Should these views be accepted, then the moving upwards and backwards of the os, which at the commencement of labour had been centrally situate, might well be regarded as a premonitory sign of rupture.

To summarize the points which to me seem of interest :

1. The first stage of labour begins when the polarity of the uterus is established.

2. Uterine polarity results from an over-stretched condition of the nerves which course through the lower uterine segment, and are distributed to the circular muscular fibres of the cervix. The painless uterine contractions and retractions of pregnancy thin out and stretch the segment, and thus ultimately induce polarity.

3. The cervix being fully dilated does not necessarily imply a sufficiently open os to permit of the passage of the fœtus.

4. The anterior cervical lip is not easily nipped or incarcerated between the pubes and the descending fœtus. The cause of its elongation is due rather to the retraction of the posterior cervical lip and the consequent dragging upwards of the os, which cannot sufficiently dilate to permit of the passage of the fœtus through it.

5. Such an os will in the case of primiparæ rupture almost certainly in order to permit of the commencement of the second stage of labour—*i.e.*, an expansion sufficiently large to permit the passage of the greatest diameter of the presenting portion of the fœtus through it.

6. Such a laceration cannot be treated by immediate suture, not alone because of the great œdema of the anterior lip, but chiefly for the reason that the posterior lip is taken up, and there is therefore nothing to which to stretch it.

7. A multiparous cervix is not always the weakest portion of the uterus. When this is so, a uterine rupture occurring as a consequence of rigid os will be preceded by none of the usual premonitory symptoms, and the tear will be most likely to involve the vagina.

CASE OF EXSTROPHY OF BLADDER AND SPLIT PELVIS COMPLICATING LABOUR.

By JAMES ADAM, M.A., M.D.

I HAVE been asked to publish a note of this case of exstrophy of bladder and split pelvis complicating labour. The interest of it seems to me to be mainly clinical, though, of course, it is of importance from the developmental standpoint. Ample reference to this subject will be found in Dr. Berry Hart's paper on 'Extroversio Vesicæ and apparent Low Implantation of the Ureter End.'* Klein,† whose paper is there mentioned, gives a table of seven labours with this anomaly. Reference to the subject is also made by Champneys.‡

The patient, as I first saw her in November, 1900, was a well-nourished woman, aged twenty-two, and about five months pregnant. In earlier years she had been told by a doctor that the extroversion might get all right when she was twenty-one. She seems to have believed and acted on this opinion; at any rate, she got married at that age.

Examination of the abdomen showed the following three structures from above downwards:

1. An umbilical area of about 3 inches diameter, covered by thin, parchment-like cuticle, which hardly seemed strong enough to retain the protruding intestine; yet the hernia did not enlarge.

2. A vesical area immediately adjoining the umbilical area above, of about the same diameter, and extending below to the tissue which replaced the pubic symphysis. This area—really a small portion of the posterior wall of the bladder—projected about 1 inch above the general surface, and shaded off at its margin into the surrounding skin, but at its inferior and most prominent part presented a raw, excessively tender, mucous surface, on which the ureters opened about 1 inch apart, and from which tiny jets of urine occasionally spurted over the parts below (there was not a continuous passive trickling). Gentle pressure just above the ureteral orifices would sometimes cause a spurt of urine, so that evidently there was a small ampulla of each ureter just above its orifice.

* *Journ. Anat. and Physiol.*, vol. xxxv., p. 37.
† *Arch. für Gynäk.*, Bd. xliii., 1938.
‡ *St. Barth. Hosp. Rep.*, 1877, vol. xiii, p. 81.

3. Below the vesical area and separating it from the vaginal orifice was a very firm fibrous band, uniting the gap between the pubic bones. This gap measured $3\frac{3}{8}$ inches. The lower end of the recti muscles seemed to be attached to the bones, and not to the fascia, and converged upward to the middle line above the umbilical area.

Separating the lower part of the median area, described above, from the thighs were the labia majora. These were large and diverged upwards. Just inside them, inferiorly, were the enlarged œdematous nymphæ. The left was specially œdematous and pendulous, almost hanging between the thighs.

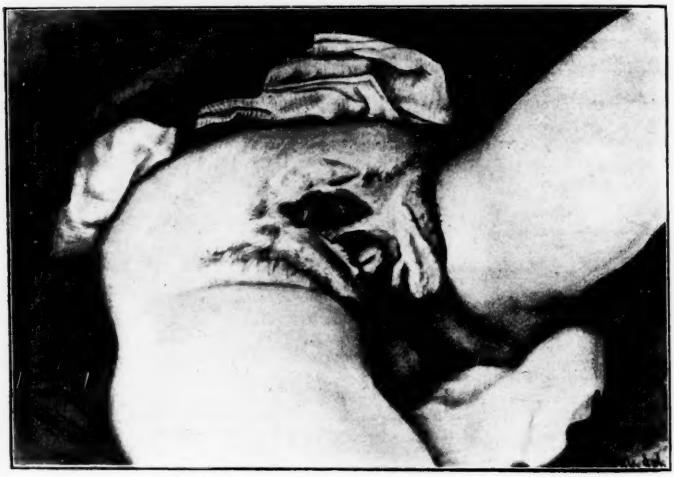

FIG. 1.—EXSTROPHY OF BLADDER AND SPLIT PELVIS.

The vaginal orifice was surrounded by a soft fringe of mucous membrane, and with difficulty admitted two fingers. The os uteri was within an inch of the orifice, the anterior fornix being easily reached in front of the os, but the posterior fornix lay much deeper, say $2\frac{1}{2}$ inches. This greater depth seemed due to the perineum being longer and thicker than normal, for otherwise the vagina was decidedly short. I could make out no trace of the clitoris.

The patient during the day wore a rubber urinal; at night she lay on pads.

Previous to conception, menstruation had always been easy and regular every four weeks.

For the greater part of the last three months of pregnancy

she had to lie in bed owing to œdema of the labia minora, and threatened prolapse of the uterus.

I was called to her on March 31, and found decided uterine contraction, but the cervical canal still quite distinct. Temperature was 103·5°, and had evidently been up for some days previous, as malaise, loss of appetite, and a feeling of feverishness had existed for about a week. Also she had had three hours of uterine pains on the previous day. I gave a morphia suppository, the pains ceased, and the patient slept. Next morning, April 1, she felt fairly well, and the temperature was 100·2°, but at 4 p.m. and 9 p.m. was 104°, notwithstanding quinine and salol. Labour began at 11 p.m., and at 3 p.m., April 2, I found the membranes tense and protruding at the vaginal orifice. The long, tough perineum, and possibly the

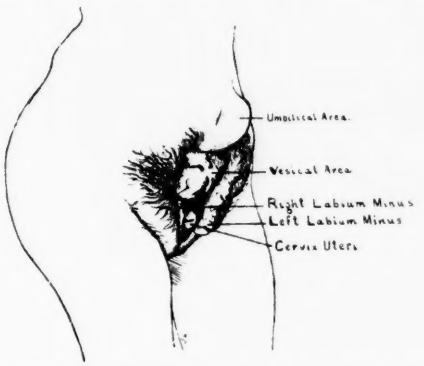

FIG. 2.—EXSTROPHY OF BLADDER AND SPLIT PELVIS. SEMI-PROFILE VIEW IN OUTLINE.

pubic gap, caused the head to pass unusually well forward, and a healthy female child, weighing probably 6 pounds, was soon born. The anterior part of the perineum, and also the soft fringe round the vaginal orifice, were torn. The membranes were adherent at the fundus: I had twice to insert my hand to remove them. For this reason, and considering that the bruised, lacerated parts were constantly bathed in urine, that the patient had a high temperature, and that her mother and only sister died in childbed, I gave an intra-uterine douche (weak carbolic in boiled water), stitched the perineum—in order if possible to cover the os—dusted with aristol, and applied a bichloride dressing. At 11 a.m. temperature was 97·2°; at 8 p.m., 101·5°.

The following day (second of puerperium) the temperature at noon was 103·3°; the parts round the vaginal orifice black and

sloughy, the cervix presenting there and its superficial parts also sloughing; abdomen distended. Vaginal douche (weak bichloride); boric wool substituted for the bichloride dressing; salol and calomel internally. Third day of puerperium: Temperature at 11 a.m., 95·5°; at 9 p.m., 99·5°. Bowels moved twice. Os and cervix projecting about 2 inches beyond vaginal orifice, and covered with dark superficial slough.

After this the temperature kept subnormal, but vaginal douching was continued till the sloughs separated, about the sixth and seventh days. For a time the patient's chances seemed small—high temperature, abdomen distended, the thin, parchment-like umbilical area ballooned out with intestine, the margin of the vaginal orifice sloughing, and, together with the superficially sloughing and exposed cervix, constantly bathed in urine. To my great surprise, the perineal stitches held, and the wound healed in greater part. I failed to make out the exact cause of the pyrexia, which was even more marked before than after labour. Possibly constipation, which was troublesome, had something to do with it. For this reason salol, calomel, and saline purgatives were given.

It is to be noted that whereas Klein says that in most of the seven labours complicated by exstrophy of the bladder, as tabulated by him,* the perineum gave trouble, and required incision, there was no need for operative interference in this case, although the perineum was long and tough. The somewhat small size of the child may account for this.

As involution proceeded the cervix gradually receded till it came to lie just at the vaginal orifice. Prolapse, of course, now occurs with the erect posture; but the womb is easily kept up by a rubber cup-and-stem pessary, which the patient wears in addition to her rubber urinal. She was seen by Dr. R. H. Parry with a view to operation for the extroversion; but this she in the meantime declines.

A photograph was taken on the fifth day, from which, and from an examination of the patient at much trouble to himself, my friend, Dr. John Lindsay, of Glasgow, has made the drawings which illustrate this communication.

* At least three of the children were dead.

CRITICAL REVIEW.

PRIMARY CANCER OF THE FALLOPIAN TUBE.

By the EDITOR.

The first edition of Mr. Butlin's 'Operative Surgery of Malignant Disease' appeared in 1887—not a very remote date. At that time primary cancer of the Fallopian tube was an unrecorded malady; but in 1888, one year later, Orthmann described an authentic case.[1] When the second edition of Butlin's work was published in 1900, the present writer was able to state in its pages that he had tabulated twenty-five cases quite recently.[2] In this Journal (September, p. 309) it was recently reported that Stoltz[3] had brought up the number to no less than forty-four cases.

It seems clear that many examples of primary cancer of the Fallopian tube have been overlooked. The present writer brought to light in 1896 an unreported case of tubal cancer[4] figured by Dr. Renaud, of Manchester, in a book of private manuscript notes, now preserved in the library of the Royal College of Surgeons. According to the drawing, there appears to be bilateral malignant disease of the tubes, which might well be primary. There is, however, a source of fallacy which must be borne in mind by all who come across a cancerous tube. A hydrosalpinx may become adherent to a cancerous ovary. Fabricius[5] and Winter[6] have very properly reported two such cases. In both instances it was easy to see that the ovary was the primary seat of cancer, as in the first there was a small cystic carcinomatous ovary, and masses of cancerous substance floated loose in the large dilated tube, entering the tubal cavity through a distinct perforation. There seemed to be no cancerous deposit in the walls and mouth of the tube itself. In the second case a pedunculated mass from a cancerous ovary projected into the cavity of the tube.

In some instances, however, it is conceivable that the seat of the primary disease cannot be so readily determined; hence Stoltz's list of forty-four cases may include one or more where the cancer really arose in the ovary. The clinical history may be misleading. Thus, a sanious, watery discharge is often seen in primary tubal cancer;

whilst in cancer of the ovary it is practically unknown. In Fabricius's case a free, bloody discharge was observed for several months before operation. The fluid came from the tube, whilst the cancer was of ovarian origin, and though cancerous matter lay in the dilated tubal cavity, it was not evident that the tube was as yet actually infected.

On the other hand, primary cancer of the tube proceeds with considerable rapidity, and at the same time is not necessarily associated with symptoms such as will send the patient post-haste to the doctor. A sanious, watery discharge may be taken for a mere necessary 'change of life' condition; whilst the tumour does not usually form a large mass rising high above the pubes. Even an abdominal swelling is frequently taken by a patient for corpulence. Hence it is not unreasonable to believe that in some cases of disseminated pelvic cancer, where the malady is so advanced that its original site cannot be determined, the malignant disease in reality arose in one of the Fallopian tubes.

The history of the discovery of primary cancer of the tube is closely linked with the extension of abdominal surgery which followed the establishment and generalization of ovariotomy. A flood of light was thrown on tubal disease in general. No doubt Lawson Tait exaggerated the gravity of salpingitis, but he played a prominent part in establishing the great truth that tubal disorders were not mere pathological curiosities, as was hitherto supposed. Rokitansky, many years since, described warty growths which he had detected on the tubal mucosa. In 1879 Spencer Wells removed a diseased tube which was stuffed with papillomatous growths, and the patient is still living, notwithstanding many alarming clinical symptoms observed before operation. The present writer described the specimen,[7] and expressed his opinion that the growths might be of inflammatory origin and akin to warts seen on the vulva in gonorrhœa. The clinical history confirmed the non-malignant and inflammatory nature of the growths, which was clearly the *papillome endo-salpingitique* recently described as a distinct pathological condition by Doléris and Macrez.

In 1888 Orthmann[1] described a case of undoubted primary cancer of the tube. About one year later[8] the present writer reported a second case. He expressed an opinion that it represented a malignant degeneration of a papilloma of the tube, itself probably of inflammatory origin. Within a few years several more cases of cancer and papilloma were reported in the United Kingdom and abroad. The close relations between inflammation and innocent and malignant growths of the tube were soon established. Kalten-

bach's case[9] was of special interest; the tumour seemed to be cancerous, but on close examination of numerous sections it appeared to be histologically innocent. The clinical history, however, belied the microscopic appearances, and extensive recurrence occurred; the disease was bilateral. This case is very important for the operator to bear in mind in respect to prognosis after an operation.

Whilst fresh examples of undoubted cancer were being detected at the rate of two or three a year, several more cases of benign papilloma were reported by Doléris, the present writer, and others.[10] Bland-Sutton advanced the theory that in some cases the growth was a true adenoma, but Doléris and Macrez maintain that it is in all cases a true papilloma of inflammatory origin. These two writers issued a valuable monograph in 1898,[11] where they demonstrated that there is a distinct form of chronic inflammation of the tube in which papillomatous outgrowths appear. In some instances the outgrowths become exuberant, and others a papilloma of the tube is developed. One year later Danel of Lille, in a treatise of great merit,[12] admitted that in many cases cancer of the tube arose at the site of inflammatory changes, but laid stress on the fact that in some exceptional instances there was no sign of any inflammatory disease in the neighbourhood of the cancer, and no clinical evidence of old pelvic inflammation. He further qualified the doctrine of pre-existent inflammation by maintaining that the preliminary salpingitis was but a predisposing cause of tubal cancer. It diminished local resistance to infection, as is seen when chronic gastritis precedes cancer of the stomach.

The statistics of alleged cases of primary cancer of the tube steadily mounted up whilst the above monographs were in course of preparation. Over a year ago Le Count,[13] of Chicago, challenged the accuracy of many reported cases. He practically agreed with Doléris and Macrez, for he was ready to allow that hyperplasia of the tubal mucous membrane due to inflammation sometimes led to the development of innocent localized growths of uncertain rank, or to more diffused growths that may possess some of the characters of malignancy. Le Count thus admitted cancerous degeneration, but he did not consider it in his case as strictly homologous with malignant changes in a papilloma. He ranked the tumour which he examined with the carcinomata which develop in scars or fistulæ from long-continued irritation; nevertheless, his careful description of the microscopical appearances of his own specimen supports the theory advanced by previous observers above mentioned, for the

growth formed an exuberant cauliflower mass, whilst there was a history of a bad labour and several abortions, very probable sources of pelvic inflammation. Le Count objects, perhaps reasonably, to the term 'papilloma,' as it, strictly speaking, implies a growth which is a neoplasm from the first, and not a product of inflammation. Since Le Count's valuable monograph saw the light, Hurdon [14] and Fabozzi [15] both reported a case of primary cancer of the tube. In both there was evidence of previous pelvic inflammation; Hurdon's patient had recently recovered from typhoid fever, a disease associated with a form of inflammation of the ovary. It should be borne in mind that in both the tumour formed papillary masses.

Lastly, Stoltz [3] has prepared a monograph of high value on primary cancer of the tube, which need not be discussed at length, as a full abstract appeared in the September number of the JOURNAL. In Stoltz's original case the tumour was papillary in appearance. Like Danel of Lille,[12] he admits that chronic salpingitis may favour the development of tubal cancer, but insists that cancer has been found in tubes free from any sign of inflammatory disease. He dwells on an opinion expressed by the present writer that the cancer may, after all, arise, at least in some cases, from aberrant relics or diverticula of the Wolffian duct; remarkably perfect tubules invested with epithelium were detected in the midst of the cancerous mass in the case described by the writer.[8] Lastly, in regard to these questions of pathogenesis, all gynæcologists who investigate specimens of cancer of the tube should suspend their judgment until the views of general pathologists respecting the possible development of cancer from old inflammatory products are clearly understood.

The clinical history of primary cancer of the tube is seldom clear. As a rule, there is evidence of old pelvic inflammation, or, at least, of recent pelvic pain in a patient about the menopause. A watery or sanious discharge is very frequent; lastly, there is a tumour on one side of the uterus, or the disease may be bilateral. It is rare that much of the tumour rises above the pelvic brim. Just as in the writer's case of papilloma of the tube there was ascites due to a patulous condition of the ostium, so in Le Count's case of undoubted primary cancer of the tube there was ascites due to the same reason, as an exuberant cauliflower mass protruded from the ostium. Again, as in Doléris' case of papilloma of the tube—where the ostium was closed but the uterine end open—there was *hydrops tubæ profluens*, so copious watery discharge has been noted under the same conditions in primary tubal cancer. Diagnosis, however, has rarely been made before operation, and the surgeon must

hesitate in many cases to make sure of the precise nature of the disease until after the tumour has been carefully examined under the microscope. Should the tumour appear to be innocent, it is highly important—as Kaltenbach's case, already mentioned, will testify—to watch the after-history of the case for over a year at least.

The only treatment for primary cancer of the tube is operation. But, unfortunately, the disease has, as a rule, advanced too far to allow of immunity from recurrence. Few cases of removal of the cancerous tube remain free from recurrence for a year. Nor is the operation free from immediate danger. There are often intimate adhesions to intestine, and the separation of adhesions containing malignant deposit involves great risks of sepsis, as is known to all who have frequently operated on cases of malignant tumours of the ovary. The diseased tube is soft, and therefore apt to burst during extraction, so that unhealthy material may be spilt into the peritoneum.

To leave the stump of a cancerous tube seems very bad surgery in these days, when surgeons perform operations on Halstead's principle for cancer elsewhere. Total hysterectomy, with removal of both appendages, seems the only rational treatment. Falk[16] has done this operation on one case, but the after-history is too short to be instructive. The abdominal route seems preferable (though Falk operated through the vagina), as many intimate adhesions may be encountered. It is a mistake not to remove the opposite appendages, as the disease has a very strong tendency to become bilateral. Pfannenstiel's principle[17] that a healthy ovary, fellow to a large ovarian tumour on the opposite side, is best removed, must assuredly apply to a tube fellow to one that is the seat of cancer.

A few months' relief is usually gained by operation, and hence the surgeon should remove a cancerous tube together with the uterus and remaining appendages, so as to improve his patient's condition. Still, at the best the prognosis is gloomy. When many years pass without recurrence, error of diagnosis must ever be suspected. In any such instance the writer's case of papilloma must be remembered. There was ascites and hydrothorax, and ugly-looking cells were detected in the fluid, but the patient, elderly at the time of operation, was in good health over twenty years later. Thus, in chronicling an unpublished case of primary cancer of the Fallopian tube, we must never forget Oliver Cromwell's advice—to conceive it possible that we may be mistaken.

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[8] *Trans. Path. Soc.*, vol. xxxix., p. 208, and pl. xiv., fig. 3, and vol. xl., p. 221.

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REVIEW OF CURRENT LITERATURE

OBSTETRICS.

The Biology and Pathology of Pregnancy (JULIUS NEUMANN of Vienna: *Interstate Medical Journal*, June, 1902).—Neumann briefly reviews the materials at present at our disposal upon which the philosophic study of the natural history of pregnancy must be based. From the very moment of impregnation changes deep and far-reaching occur in the maternal organism—changes which have manifestations both 'psychic and somatic.' Menstruation ceases; probably the ovaries cease to discharge ova, and discontinue their other important function known as internal secretion. The nervous system shares in these changes, the patella-reflex becomes increased, the resistance of the skin to electric currents becomes diminished, and the rhythm of the cardiac cycle becomes slowed. Alterations in the vaso-motor system occur, evidenced by such conditions as dermography; there is often a change in disposition, and other psychical disturbances may become manifested. Nausea, headache, vomiting, and salivation may also be marked features. Recent investigations tend to prove that these symptoms depend upon some change in body metabolism, possibly of the nature of an auto-intoxication. In the latter months of pregnancy two additional factors must be taken into account—fœtal movements and the pressure exerted upon other organs by the enlarging uterus.

Old and chronic inflammatory lesions of the pelvic organs dependent upon gonococcus or other forms of infection may, with the advent of pregnancy, awaken to new life and vigour, and 'pregnancy, labour, and the puerperium bring every woman into the great danger of contracting an infection.'

Upon new growths of the pelvic organs pregnancy has a marked effect, leading to a rapid increase in their size. Diseases of distant organs, such as pulmonary tuberculosis or valvular disease of the heart, are profoundly influenced by it, whilst these in their turn not infrequently lead to premature delivery. There is, furthermore, a group of diseases the existence of which is bound up with the existence of pregnancy—eclampsia, hyperemesis gravidarum, and osteo-malacia. Turning to the ovum, various morbid conditions are briefly touched upon—ectopic pregnancy, those cases of morbidly adherent placenta where there is complete absence of the serotina with direct insertion of the villi into the uterine muscle, and finally

'destructive' hydatid mole and deciduoma malignum. We are forced to consider the ovum a parasite even under normal conditions, and the likeness is still more striking in these, fortunately rare, conditions, in which parts of the ovum invade and destroy maternal tissues. Deciduoma malignum is a malignant new growth, which develops after pregnancy at the very place where the ovum was situated. The author continues: 'I believe it is a degeneration of a cancerous type of the epithelial covering of the chorionic villi. Upon the examination of a number of hydatid moles, I have been able to show that in all cases in which at a later date the development of a deciduoma was discovered, the mole itself revealed certain characteristics of malignancy. I found that the syncytium had invaded the deeper stroma of the villi, in a manner entirely analogous to the condition of the epithelium in cases of cancer. . . . Whilst the last word has not yet been spoken in regard to the etiology of this growth, the modern understanding of this tumour formation has brought about a complete revolution of our views regarding the possible pathogenic aspects of pregnancy. This remarkable fact has at least been established, that the ovum, or more exactly certain cellular elements of the ovum, are liable to give rise to the formation of a malignant growth, and we have found that this cancerous transformation of the ovum may already begin during pregnancy.' H. W.

Two Cases of Placenta Prævia Centralis (PETERS: *Cent. für Gynäk.*, No. 16, 1902).—The patients were aged twenty-six and thirty-two years respectively; the one had had two children, the other six. Both were strong women of the working class; the second (aged thirty-two) had had one abortion. In the first case hæmorrhage first appeared four weeks before term. It followed coitus; was slight at first, but soon became severe. Delivery was induced immediately. In the second case hæmorrhage occurred in the twenty-ninth week of pregnancy; induction of labour was carried out seven weeks later. In the first case a tampon of iodoform gauze was inserted in the vagina, then a colpeurynter was used. In nine hours the os was the size of a crown piece. In the second case the os was fully dilated at the first examination. Both cases were delivered by turning.

In each instance the placental margin was out of reach, and the placentæ were perforated centrally by two fingers. In the first case the membranes were torn and some amnion prolapsed, making it difficult to seize the foot. In the second case the membrane was perforated by the sound. On each occasion extraction took a long while to carry out. In delivery of the aftercoming head the os was cautiously stretched with the finger. There was no cervical or perineal tear. The bleeding caused by perforation of the placenta and during turning was great; the placentæ had to be stripped off,

as Credé's expulsion method was tried for half an hour without success. The blood lost was considerable, but soon ceased. Both children were born alive. The first child died one and a half hours after birth, the second sixteen hours after delivery.

Both cases recovered from their anæmic states without subcutaneous infusion being employed. No tamponading of the uterus was needed, and there was no subsequent hæmorrhage in either case. The puerperium for each patient was normal.

In Case I. the placenta was marginate to a considerable extent, the membranes were torn, and a large part of the dependent part of the placenta had been divided by the child's head. In Case II. the placenta had a complete circular edge. There was a central hole through which the child had been delivered. C. L.

Polyhydramnion, Differential Diagnosis and Treatment, with Report of Cases (Edw. P. Davis: *The Charlotte Medical Journal*, North Carolina, U.S.A., vol. xxi., No. 2, August, 1902).—By polyhydramnion is meant more than 2 pints of amniotic liquid at full term. The pathology of the condition is obscure. It is normal at the fourth month, and its persistence results from failure in normal development. The placenta is often large, dropsical, and infiltrated, Jungbluth's vessels enlarged, and the amnion and chorion thickened and fissured with fatty degeneration of their cells. Venous engorgement, or irritating substances in the lymphatics, may cause this condition, and excessive secretion from the cerebro-spinal canal of the fœtus may contribute to it. It does not result from increased renal action in the fœtal kidneys.

In the diagnosis the first point is the recognition of pregnancy. In polyhydramnion evidence of faint uterine contraction can usually be obtained, and a presenting part can often be detected by a finger in the cervix. In ovarian cyst the illness is longer, and the swelling at first unilateral, the intermittent hardening of the tumour is absent, and the uterus is not enlarged. In ascites the dulness changes when the position of the patient is altered. When pregnancy is found, the condition must be distinguished from pregnancy and ovarian cyst, pregnancy and ascites, plural pregnancy, hydatid mole, or a very large or malformed fœtus.

Treatment is necessary when the distension increases rapidly, and the patient's health is impaired. Treatment by drugs is useless. A pair of dressing forceps should be pushed through the membranes, and the blades spread wide enough to admit the finger. Fluid should be allowed to escape gradually until the presenting part descends against the cervix. Firm pressure should be maintained over the abdomen. Uterine hæmorrhage and sepsis are the chief dangers to guard against.

The following cases are reported:

1. A multipara, whose health was much depressed by the rapid distension of the abdomen. Treated by rupture of the membranes, followed by compression by an abdominal bandage. Eleven quarts of liquor amnii escaped. The fœtus was still-born, and, except that it had little tissue in the cord and brain, was well developed. The uterus was douched and tamponed. The mother made a good recovery.

2. Multipara sent for removal of a cystic tumour, supposed to be ovarian. She had suffered from much nausea, and rapidly increasing distension of the abdomen, beginning at the fifth month. The membranes were ruptured, and about 2 gallons of fluid were allowed to escape. Labour followed, and twins—one in an unbroken sac, and the other in a hydramniotic sac—were born. The placenta was large and œdematous, the veins of the cord of one twin greatly enlarged and tortuous, and the tissue of the placenta and cord granular, with areas of cystic degeneration. The mother made a good recovery.

3. A primipara in tedious labour at the ninth month of pregnancy, with excessive liquor amnii. She had a severe fright from lightning early in pregnancy. A male child, weighing 5½ pounds, was delivered by forceps, but only survived its birth by ten minutes. The posterior portion of the vertebral column and the lower cervical and upper dorsal region were defective, and a meningocele was present. The placenta was thicker and larger than normal, the cord was very long and spiral; the quantity of liquor amnii was not much in excess.

4. A primipara of eighteen, who complained of abdominal pain, dyspnœa, and sleeplessness. The abdominal distension was marked, the fœtus could not be outlined, nor the heart-sounds be distinctly heard. The patients' legs were swollen, and the heart-action laboured. The urine was normal. After several days of indefinite pains the os was found dilated, so the membranes were ruptured, and abdominal compression applied. The child was born immediately, and the placenta removed, and the uterus douched and packed with gauze. The child only gave a few gasps, though the heart-beat could be detected for three-quarters of an hour. The cord was shorter than the average, the placenta boggy, light in colour, large and pliable. The decidua was much roughened, and resembled a fibrinous exudate. At the autopsy on the child general dropsy was found, and a large quantity of fluid in the abdomen and pericardium. The lungs were œdematous, the kidneys showed atrophy of the pyramids, and the liver was softened and enlarged.

5. A multipara in labour, with dilatation well advanced, but with insufficient pains. The membranes were punctured, and several quarts of fluid allowed to escape. Quinine and ergot were then administered. The child was speedily delivered, but died ten days later of malnutrition. W. F.

Intestinal Obstruction during Pregnancy and the Puerperium (CONSTANTIN-DANIEL: *Rev. Prat. d'Obstetrique et de Pædiatrie*, May-June, 1902, p. 173).—Forty-nine cases of intestinal obstruction have been met with during gestation or the puerperium. In thirty-five the obstruction occurred during pregnancy, in two during labour, and in twelve in the first few days of the puerperium. Most of the cases occurred in the later months of pregnancy; none were met with before the third month. Multiparæ between the ages of twenty-five and forty-five were affected most frequently. Budin has pointed out that the obstruction is produced by the direct pressure of the fundus uteri on the intestine, or of the fœtal head on the rectum, and it is most likely to occur if there be any abnormality in the position of the intestine. The symptoms of obstruction during pregnancy resemble those of intestinal obstruction at any other time. If obstruction occur during labour, the symptoms are a sudden violent pain, with a sensation of tearing, in the abdomen; but these symptoms are apt to be masked by the uterine contractions. After parturition the occurrence of obstruction is gradual, and the pain at first is so mild as to be mistaken for 'after-pains.'

Vomiting is not so frequent a symptom as in ordinary intestinal obstruction, and its diagnostic value is impaired since it may be confused with the simple intractable vomiting of pregnancy or with the vomiting which often occurs during labour. Constipation is not so complete in obstetrical as in ordinary obstruction. Physical examination is impeded by the enlarged uterus.

Three complications—abortion or miscarriage, intestinal perforation, or peritonitis without perforation—may occur in the course of obstruction. Of twenty-eight cases, eleven, according to Vergez, terminated by premature expulsion of the fœtus. Intestinal perforation is a rarer complication. It was found thrice in twenty-eight cases during pregnancy, and once in two cases during labour. Peritonitis without perforation is a very rare complication.

The prognosis is grave during the puerperium, but more serious during pregnancy and labour, since the life of both mother and child may be endangered. About 50 per cent. of the mothers succumb, and the infantile mortality in cases occurring during pregnancy is equally high.

The diagnosis is often very difficult. During pregnancy it may be confused with all the different varieties of colic—*e.g.*, hepatic, intestinal, renal, or tubal colic. It may also be mistaken for labour; but the absence of regular uterine contractions, accompanied by increase of pain and the lack of changes in the cervix uteri, enable us to exclude labour.

Appendicitis or extra-uterine pregnancy may confuse the diagnosis. During labour the condition may be confused with rupture of the

uterus, or with intestinal perforation caused by the dragging on old peritoneal adhesions set up by the uterine contractions. During the puerperium the 'after-pains' or acute peritonitis may mask the diagnosis.

Proper treatment during pregnancy is to perform laparotomy, as for ordinary obstruction. During labour we should hasten delivery, and immediately afterwards perform laparotomy. After parturition the treatment is absolutely the same as in a case of obstruction occurring apart from pregnancy. R. W. McK.

Labour complicated by Rectal Cancer (*Z.* ENDELMAN: *Cent. für Gynäk.*, No. 32, 1902).—Pregnancy complicated by rectal cancer is rare. Endelman finds records of thirteen cases only. The reason for its infrequency is two-fold: carcinoma of the rectum is rarer in women than in men, and does not occur usually until the child-bearing period is passed. Holzapfel states that the obstetrical treatment depends upon (1) the possibility of removing the new growth; (2) the degree of pelvic obstruction produced by the presence of the growth; (3) the life or death of the fœtus.

In cases of inoperable cancer we must aim at securing a living child; delivery *par vias naturales* is, in such cases, nearly always impossible. Cæsarean section is indicated. This has been done by Kaltenbach, Polk, W. A. Freund, Zweifel, Jordan, Duncan, Holzapfel.

If the cancer has grown so rapidly that death is to be anticipated before the end of pregnancy, Cæsarean section is indicated; or if the passages will permit, induction of labour may be carried out. In inoperable rectal cancer with a dead child *in utero*, Cæsarean section must only be done where it is absolutely indicated—*i.e.*, when other obstetric operations are impossible (here it should be remembered that carcinomatous tissue is more friable than normal healthy tissue). Cruveilhier by turning and Kursteiner by perforation delivered their respective cases by enlarging the passages, by compressing and tearing asunder the friable growths which presented obstruction. Such cases teach that where the vaginal route can be used it is easier and less fatal than Cæsarean section.

Where the growth is operable, it should be removed without delay. Should this be done during pregnancy, or after the uterus is emptied? Endelman finds one case only in which enterectomy was performed during pregnancy. This was carried out at the sixth month by Petersen, according to Kraske-Rydyier's method. Fourteen cm. of bowel was removed. Abortion occurred fourteen days later, and the patient died the next day. The wound in this case became infected, and this no doubt disturbed the pregnancy. A small growth situated low down might be removed without risk, but in all other cases labour should be induced before the operation for cancer is

undertaken (Löhlein). Endelman advises similarly, and for the following reasons: (1) Before delivery a surgical operation on the rectum leads to greater hæmorrhage than would be occasioned in the non-gravid state. (2) Resection of the rectum is nearly sure to lead to abortion. (3) The wound may be infected by the lochia, especially if Rehn's vaginal method be adopted for the removal of the rectal growth. These reasons induced Endelman to bring on labour in the following case of rectal cancer.

The patient, thirty-two years of age, complained of constipation, painful defæcation, and rectal hæmorrhage. The first confinement took place nine years ago; labour was normal, but puerperal fever followed, and ever after the patient complained of sacral pain. The second and third births were normal. The last period was seven months ago. For a year and a half blood had been noticed in the stools, pain had increased ever since conception, and the constipation had become obstinate, and defæcation was accompanied with blood, headache, and sacral pain. Present state: The patient is badly nourished, mucous membrane pale, seven months pregnant, a hard mobile tumour is felt through the posterior vaginal wall, and per rectum the same is felt to be growing from its anterior and lateral walls two fingers' breadth above the internal sphincter, and it reaches for 3 cm. up the bowel. A bougie was passed into the uterus, and the vagina packed with iodoform gauze. The induction was completed by means of De Ribes' bag. Seven weeks later the rectal growth was removed by Rehn's vaginal method, the rectal stump was turned through 180° and sewn to the skin. Six weeks later the patient left hospital with slight incontinence of fæces.

In the whole of European literature Endelman finds only three analogous cases—Löhlein's, Mac Viel's, and Heusner's. C. L.

Hæmorrhage into the Spinal Cord during Pregnancy (Alexander Bruce, M.D., F.R.C.P. Edin.: *The Scottish Medical and Surgical Journal*, August, 1902).—A woman, aged thirty-one, pregnant for the eighth time, was admitted into a hospital with the following history: Since she became pregnant, five and a half months before admission, she had suffered from severe vomiting. Two days before admission, during the act of retching, she 'felt something twist round and tear and give way on the right side at the level of the waist.' She fell to the floor, and experienced severe shooting pains all over the body; the arms and legs at first twitched, and then became paralyzed; the paralysis of the arms, however, only persisted for twenty-four hours. On admission to hospital, thirty-six hours after the onset of the symptoms, the following condition was found: Complete anæsthesia below a line extending through the lower border of the areolæ of the nipples, and the spine of the seventh dorsal vertebra posteriorly. The right hand and arm were weak, both legs

were œdematous. The left bone-jerk was totally lost, the right still present. There was no ankle clonus. Complete paralysis of voluntary movement in both lower limbs and in the abdominal muscles was present; the bladder was greatly distended, the anus was projecting, and the sphincter lax. There was no area of hyperæsthesia. Forty-two days after admission to hospital twin fœtuses of the sixth or seventh month were expelled from the uterus painlessly, and without any voluntary effort on the part of the patient. After this, bedsores and bronchitis supervened, the patient dying from exhaustion and pulmonary complications three weeks later. A hæmorrhage was found in the cord extending from the sixth cervical to the first lumbar vertebra. It presented different features at different levels. In the mid-dorsal region the hæmorrhage occupied nearly the whole of the interior of the cord, in the upper dorsal and cervical region it lessened rapidly and was limited to the gray matter, and at the fifth cervical was confined to the posterior cornua. The hæmorrhage appeared to have originated about a rod-like tumour of an angio-gliomatous nature, which was found traversing the cord. The author refers to Dr. Amand Routh's paper on 'Parturition during Paraplegia' (*Trans. Obs. Soc., Lond.*, vol. xxxix., 1897), and remarks: 'Dr. Routh's conclusions from these cases are that if the lesion is in the lumbar region, the uterus may begin the labour automatically, but cannot complete it; that if the lesion is above the lumbar region, the act can be completed, thus showing that the reflex mechanism in the lumbo-sacral region is sufficient of itself without any voluntary assistance. The case here recorded supports the latter of these conclusions. It also shows that the sensory path from the uterus enters the cord in the lumbo-sacral (and possibly in the lower dorsal) region.' H. W.

Ovarian Pregnancy (THOMPSON: *American Gynæcology*, July, 1902, vol. i., No. 1).—The patient was a 2-para of thirty-two, who had suffered from pelvic pain at irregular intervals for about seven years; there was no amenorrhœa, but almost continuous pain for a month led to an examination, and the detection of an extremely tender enlargement on the left side of the pelvis, the exact nature of which was not definitely determined. An exploratory incision was advised and performed. A small tumour of the left ovary was found, so the appendages of that side were drawn up into the wound. A dark red tumour was seen on the inner and upper border of the ovary. The tube was not adherent, the fimbriated end projecting clear of the outer end of the ovary. There were slight adhesions on the anterior surface of the ovary, but none on the tube. The appendages were removed, and the patient made an uninterrupted recovery. On examination of the specimen, the ovary was seen to be somewhat larger than normal, and on its upper end was a

brownish-red tumour about the size of a horse-chestnut ; the external coat of the ovary was continued over the base of the tumour. No rupture had taken place previous to the operation. The tube was patulous ; its fimbriæ were entirely free one from another, and there was no spreading of the fimbriated extremity over the surface of the ovary. A section made through the front of the tumour showed a thick wall, which seemed to be made up of blood-clot separated by fine partitions, the inner wall of the ovisac being drawn into convolutions. The method of attachment of the chorion was plainly seen. Opposite the opening a fœtus was attached to the wall of the ovisac, in the part above the ovary proper, by an umbilical cord 1·5 cm. in length ; the fœtus measured 1·2 cm., not extended, and was estimated to be twenty-five to thirty days old. No trace of the amnion could be found. The base of the tumour rested upon and was included in the substance of the ovary to a depth of 1·5 cm., but the greater part of the ovisac projected beyond the surface of the ovary. A photographic reproduction of the specimen accompanies its description, also diagrams of the cross section of the ovisac and of a section of its wall. The author discusses the macroscopic and microscopic appearances, and enumerates the points which go to substantiate its claim to be a true ovarian pregnancy. J. T. F.

GYNÆCOLOGY.

Uterine Castration by Superheated Steam in Hæmophilia (Ludwig Pincus : *Cent. für Gynäk.*, No. 22, 1902).—Pincus records further cases in support of the above treatment. A previous article on the subject appeared in the *Cent. für Gynäk.*, No. 8, 1902. Pincus draws attention to the fact that this treatment causes no detrimental psychical or other effects. In hæmophilia sterilization by section of the Fallopian tubes is contra-indicated ; atmocausis establishes a new and successful line of treatment—by its means the destruction of the function of the uterine mucous membrane is secured and impregnation prevented ; in fact, a prophylactic sterility is brought about.

We learn from the work of Börner, Stumpf, and V. Lunbeck that hæmophilia in females is more common than it is usually thought to be. Pincus deals with hæmophilia pure and simple—*i.e.*, those cases in which, as we know, a young girl may bleed to death at the first, or at a later menstrual period, or even from an abrasion of the skin. It is in such cases that atmocausis is successful, as has already been proved by Gummert, Von Guérard, Stoeckel, and the author. Pincus asks the questions : (1) Ought hæmophilic girls to marry ? (2) Ought

we, in adopting atmocausis as a treatment for hæmophilia, to have any regard for the possibility of future marriage? The answer to the first question is uncompromisingly negative. With regard to the second query, where the question concerns a girl at the age of puberty who is brought to death's door by profuse loss, we are driven by the necessity of saving life to ignore all such future considerations.

Von Guérard operated upon a girl of twenty-one years who was the sole surviving child of a hæmophilic mother. Her mother and sister died of hæmorrhage. The operation was (presumably) performed in 1899, and, in reply to the author, Von Guérard wrote on January 23, 1902: 'The hæmophilic patient is quite well. She has not menstruated since the operation. She is now well nourished, and has married. Of course, she has never been pregnant.'

Stoeckel, of Bonn, published the case in September, 1900, of a child aged fourteen years, who was admitted in an apparently hopeless condition, 'with corpse-like pallor, exhausted, unable to walk or stand, and altogether a woeful object.' When she was discharged, after undergoing 'atmocausis,' she was fresh and rosy, with her cheeks quite filled out, and Fritsch stated a few days ago, in writing to Pincus about this case, that she was well; amenorrhœa persisted; she had no pain; the sound had not been passed, so that obliteration of the cavum uteri could only be regarded as highly probable.

Gummert, writing on February 11, 1902, about a case published in 1899, says: 'Menstruation is regular at intervals of three, four, five, and six weeks. It continues two to eight days. On one occasion the loss was severe, but it is usually slight. The patient is still chlorotic from epistaxis, but otherwise well.'

Pincus himself operated upon a case in which the diathesis showed itself in the puerperium. He does not say on what day he performed atmocausis, but it was not at first successful, and was unsuccessfully followed up by injections of ergotin and gelatin. On the eighteenth day of the puerperium he again applied superheated steam, and at the time of writing amenorrhœa had been absolute for two and a half months.

Pincus states, should the bleeding show itself, as is unusual, only in the puerperium, prophylactic atmocausis about the eighth to tenth day is to be considered. If serious bleeding occur, then actual castratio uterina atmocaustica (query, a more thorough application of superheated steam) is to be done. The slighter the attack of hæmorrhage, the better will be the result of treatment. If puberty be passed in safety, 'obliteration' will only be indicated in the puerperium or for primary post-partum hæmorrhage. In the puerperium, it is needed when fatal bleeding threatens in a woman in whom hæmophilic heredity is certain, as shown by melæna and the like. For post-partum hæmorrhage in a notoriously hæmophilic woman atmocausis

must be carried out without any hesitation: tendency to bleeding is lessened. Experience teaches that the diathesis is attenuated as age advances. It is advisable to get the patient's permission to secure sterility in writing. The possibility of cervical menstruation is to be noted. It is as improper to destroy the cervical mucosa, and so produce stenosis and atresia by atmocausis, as it is to perforate the wall of the uterus by curetting. If cervical menstruation occurs, it can easily be stopped by other caustic measures.

Pincus concludes by recording one more successful case, as follows: The patient was a virgin, who suffered from profuse meno- and metro- rrhagia. Castration by steam was carried out five years ago in the Danzig Clinic. 'Since the operation the periods have never returned.' C. L.

The Relative Advantages of Complete and Partial Hysterectomy (*Amer. Journ. Obstet.*, August, 1902).—A highly instructive discussion on this subject took place at this year's meeting of the American Gynæcological Society. Montgomery of Philadelphia preferred panhysterectomy, as it was more expeditious, rendered hæmostasis more secure, and decreased the danger from sepsis by leaving no space in which fluids could accumulate and become infected. Noble believed that it was safer to remove the cervix, but he admitted that he had done over 300 hysterectomies, and had never seen cancer of the cervix except in one case, and in that instance it was present before operation. He also was doubtful about the alleged good results of panhysterectomy, and had been informed that of ten 'exhibition operations' by the same surgeon, eight of the patients had bled to death, a ninth died of tetanus, and one recovered. Cushing advocated leaving the cervix. That structure had a certain physiological function of its own, and this was a sufficient reason for leaving it in all young women, and was a more important consideration than was the chance of malignant degeneration. Palmer Dudley openly denounced Doyen's panhysterectomy as 'scientific butchery,' especially when performed for epithelioma of the cervix. The abdominal incision was made large enough, in one operation which he witnessed, to admit a man's head. In a second, also for cancer, the colon was damaged. Philander A. Harris objected on sound surgical grounds to removal of the cervix. It was better for the integrity of the vagina to leave the cervix. Janvrin stated that in all cases of uterine fibroid, where there was unmistakably no disease of the cervix, and where there was sufficient cervical tissue remaining to form a stump, it had been his practice to leave part of the cervix. Matthew Mann objected to supracervical hysterectomy. He had been obliged to dilate the cervix during convalescence in some cases to allow infected blood to escape. He was now convinced that the cervix ought to be removed, par-

ticularly if the woman had borne children, or if there was laceration of the cervix, or any other suspicious local condition. If the cervix were removed in every case, more lives would be saved. Clement Cleveland used to do panhysterectomy for fibroids. Since he had found that catgut could be perfectly sterilized by cumol, he had returned to the supravaginal method, sewing up the cervix completely from the bottom with one or two layers of common catgut, rendered sterile by cumol. Riddle Goffe favoured the supravaginal operation for fibroid disease, with careful closure of the peritoneal flaps. Convalescence was more prompt and smoother in cases where the cervix was left, the vagina retained its size, and there was much slower atrophy of that canal. These considerations were important, as in fibroid disease the patient was relatively or absolutely young. In cancer of the cervix, of course, panhysterectomy was needed. William H. Baker preferred the supracervical operation when the cervix was long and healthy, and the operation prolonged on account of the size of the tumour. In cases of suppurative disease of the appendages the entire uterus should be removed, and drainage established through the vagina. Stone of Washington disbelieved in malignant degeneration of the cervix. He had seen one case of sarcoma, but it was associated with the uterine tumour; the cervix was removed successfully some time after the hysterectomy. Stone deprecated the ligature of vessels in the cervix. He lost two cases through suppuration around the ligature silk, resulting in embolism and sudden death. He had adopted the angiotribe with excellent results. Davenport of Boston preferred to leave the cervix in cases of hysterectomy for fibroid. He thought (as did Noble) that the dangers of infected blood-clot in flaps could be avoided by improved methods of manipulation and asepsis. The flaps should not be made too large; when sutured, a portion of the uterine tissue should be included, as well as the peritoneum. The suture should be continuous. Baldy also strongly advocated the running suture. He always examined the cervix after the operation, and had never seen it fail to atrophy at the menopause. In panhysterectomy the vagina was shortened for quite an inch and a half. Montgomery denied the correctness of the reported high mortality of panhysterectomy. The retention of the cervix did not seem to have much influence on the subsequent nutrition of the vagina. The shortening of the vagina had been exaggerated by the advocates of the supracervical operation. When the cervix was left, and the uterine ligaments were tight, it received its nutrition from the vaginal arteries; hence the cervix remained as a parasite in the vagina rather than a support to its subsequent nutrition. He admitted, however, that degeneration of the cervix was too rare a change to be of practical importance. He had only once had to operate on the cervix subsequent to

supracervical hysterectomy. Altogether there was a majority in this discussion in favour of leaving the cervix when hysterectomy was performed for fibroid. In respect to care about the management of the stump of the cervix, Palmer Dudley warned the operator that, as catgut was twisted when it came out of the glass, the assistant who handled it was apt to pull it through his fingers to get the kinks straight—a bad practice, which must sometimes entail infection. A. D.

Intra-Abdominal Hæmorrhage and Pelvic Hæmatocele (J. B. KELLIER: *Quarterly Medical Journal*, August, 1902).—The author briefly describes sixteen cases of intra-abdominal hæmorrhage which have recently been under his care. These cases are divided into three classes: (1) Diffuse intra-abdominal hæmorrhage; (2) Intraperitoneal hæmatocele; (3) Extraperitoneal hæmatocele. In Class 1 there are 2 cases, both instances of ruptured tubal gestation. In Class 2 there are 7 cases, 1 of ruptured tubal gestation; 1 of carcinoma of the uterus; 1 of 'chronic pelvic inflammation, in the course of which hæmorrhage suddenly supervened'; 1 of 'chronic endometritis and pelvic congestion—a vessel suddenly giving way'; and, lastly, 3 for which no cause is suggested. In Class 3 there are again 7 cases—3 of these were probably instances of ectopic gestation; the origin of the other 4 cases was not clear. From a study of the cases the author concludes: (i.) That operative interference is necessary more often than the usual teaching prescribes; (ii.) that for the majority of the cases, the vaginal operation is the more satisfactory; (iii.) that for a certain number of the cases, particularly those in which the diagnosis is not clear, the better method is to open the abdomen. H. W.

Ovarian Fibromata (PETERSON: *American Gynæcology*, July, 1902, vol. i., No. 1).—The author bases his study of these growths on two cases of his own and eighty-two reported in medical literature. A clinical history of his own two cases and a pathological report of the specimens are given, together with four illustrations. In his discussion of the subject fibromata and myomata of the ovary are considered together. These growths are not such a rarity as was formerly supposed. They occur earlier and in relatively greater numbers during early sexual life than do fibrous growths of the uterus. While relatively the largest number are found during or just after the menopause, a considerable percentage of cases occur proportionately later in life than is the case with the uterine fibromyomata. In six cases out of the eighty-four, both ovaries were affected. Neither meno- or metro-rrhagia is a very constant accompaniment, but is more apt to occur when both ovaries are affected; there is no evidence of the growth of an ovarian fibroma causing cessation of the menstrual function, and, in fact, the time at which

the menopause appears is somewhat later than under the normal conditions. It is extremely difficult to gather definite information regarding the duration and rate of growth of these tumours; the growth may extend over many years before reaching large proportions or giving rise to marked symptoms, whilst, on the other hand, in a smaller number of cases the growth is most rapid, and reaches considerable proportions, and gives rise to noticeable symptoms in a comparatively few months. Pain is present to a greater or less degree in nearly one-half the cases, and is most frequently met with in tumours of moderate size. Freedom from pain means, as a rule, the absence of adhesions of the growth to the surrounding organs. Dysuria is a symptom in about 15·6 per cent. of the cases. While, even in the case of large tumours, the uterus will be found unconnected with the growth, it is not always an easy matter to determine this fact prior to the operation. In the absence of ascites, the smaller and more movable the tumour, the easier will be the diagnosis. Ovarian fibromata do not produce any changes in the size of the uterus, and the position of the uterus is but little affected, though retro-displacements may be produced by large centrally situated tumours in a small proportion of cases. Ascites is present in about 40 per cent. of cases, and may be large in amount, and give rise to distressing symptoms. The largest tumours are not associated with the greatest amount of fluid. The peritoneum does not show evidences of inflammation in these cases; the fluid as a rule is clear, and without much colour. Adhesions to the surrounding structures were present in 26 per cent. of the cases, twisting of the pedicle in 10 per cent., calcification of the tumour in 13 per cent., and some degree of cystic degeneration in 25 per cent. As the result of microscopic examination, the growths were described as fibromatous in 75 per cent. of the cases, and as fibro-myomatous or myomatous in the remaining 25 per cent. The mortality in the cases operated on was 6 per cent. J. T. F.

Three Rare Operations on the Urinary Organs (NOBLE and BABCOCK: *American Gynæcology*, July, 1902, vol. i., No. 1).—The operations described are two nephrectomies, and the removal of a stone from the left ureter by the extraperitoneal method. The nephrectomies were done by the lumbar incision, one for what is called hypernephroma of the kidney—a tumour of adrenal origin—and the other for papillary carcinoma of the kidney. In the latter case the patient had suffered from attacks of renal colic, and a possible relationship between the mechanical irritation of calculi to similar new growths is suggested. The growth consisted of multiple squamous papillomata, springing from the mucous lining of the upper half of the pelvis of the kidney, which had distended the pelvis, penetrated it, and invaded the kidney substance. The stone in the

case of ureteral calculus was discovered by the X-rays to lie in the left ureter about the pelvic brim. At the operation the stone was found about 2 cm. below the pelvic brim and removed, the patient making a good recovery. The authors draw attention to the importance of the X-ray in this department of surgery. Without it, the kidney would first have been exposed and searched for stone, but with the X-ray report that the stone was in the ureter, and that the kidney was free from stone, all this unnecessary mutilation was avoided, and the operation was a direct and most satisfactory one.

J. T. F.

Cystic Epithelioma of Ovaries developed after Total Abdominal Hysterectomy for Cancer of the Cervix (F. JAYLE and X. BENDER: *Bulletins et Mémoires de la Soc. Anatom. de Paris*, March, 1902).—A woman, aged fifty-seven, suffered from cancer of the cervix, with ulceration and fœtid discharge. On May 9, 1901, Jayle removed the uterus, first separating the cervix from the vagina, then removing the entire organ through the abdomen. The uterus gave way as it was being drawn up, and some pus escaped, but only on compresses placed around the seat of operation. Jayle wished to finish the operation quickly, for fear of infection, so, contrary to his usual practice, he left the appendages, which were absolutely healthy. The patient felt in good health until October, 1901, then she complained of pain in each iliac fossa. Abdominal swelling set in, with emaciation. At the end of September she re-entered hospital. There was much ascites, and a large tumour almost blocked the pelvis. Jayle operated once more on January 12, 1902. The peritoneal cavity contained about 10 pints of ascitic fluid. A large proliferous tumour was removed, as completely as possible, from the left side of the pelvis, but there were adhesions infecting the pelvic walls with new growth. A few nodules under the peritoneum, quite distinct from the tumour, represented recurrence of the uterine growth. The site of the right ovary was occupied by a tumour as big as a fist; it was removed, but incompletely. A gauze drain was introduced into the pelvis; a fistulous tract in the abdominal wound ensued. The patient left hospital on February 15, 1902; no further history is given. The left tumour contained numerous distinct Graafian follicles. It was a bulky, friable, soft mass, with much colloid material. The right was similar in consistence, but no normal ovarian tissue could be traced. Microscopically, both tumours proved to be primary cystic epithelioma, very malignant, and with marked colloid degeneration.

A. D.

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Obituary Notice.

EDOARDO PORRO.

THE name of Porro has passed permanently into the nomenclature of obstetrics, just as the names of so many anatomists, physiologists, and surgeons are associated with structures, processes, and operations in the whole of medical science and practice. Yet, as in the case of so many others, the medical profession in Europe, and even the specialists in obstetrics and gynæcology, have known comparatively little of the per-

sonality of the remarkable man who has recently passed away at the age of sixty years. His active professional career was comparatively short, and for the last ten years or so of his life, active participation in work other than that of the obstetrician, and to some extent, impaired health and energy, have dissociated him from professional functions and those ephemeral professional publications which confer eminence upon, or at least give prominence to, many, in the eyes of the contemporary world of medicine.

Porro was born at Padua in 1842, and he died at Milan on July 18, 1902. He received his early education in Padua, and, in spite of considerable embarrassment owing to want of pecuniary means, he obtained

his medical diploma at the University of Pavia at the age of twenty-three. Instead of devoting himself at once to the pursuit of his profession, he volunteered as a soldier under Garibaldi, and followed the revolutionary leader in the cause of Italian unity in the campaign of 1866 in the Tyrol, and he was present the following year at the surrender of Mentana. This event closed his soldier-career.

Next year he was appointed to the position of assistant in the department of obstetrics in one of the hospitals in Milan. For over seven years he devoted himself to the study and practice of obstetrics and gynæcology, and the testimony of all his biographers goes to show that as instructor and clinician he was industrious, exact, energetic, and original, yet conservative and honest.

In 1875 he obtained the appointment of Professor of Obstetrics in the University of Pavia, 'not by the protection of the great or by caprice of fortune, but by the force of true and real merit.'

The epoch-making operation, with which we associate the name of Porro, was first performed on May 21, 1876. The operation was far removed from being a mere stroke of happy chance, or the fortuitous result of operative proceedings commenced under a misapprehension or mistaken diagnosis, as has been so often the case in the initial stages of advances in gynæcology. It was led up to by years of reflection and experiment. Among the most powerful influences on his mind in favour of Cæsarean section, was his systematic investigation into the results of induction of premature labour during his residence in Milan. In 1871 he published 'Risultati apparenti e risultati veri del parto prematuro artificiale.' The indications for induction arose chiefly from contraction of the pelvis produced by rachitis or osteomalacia. In 148 cases, 102 of the children were born alive, but only 22 survived at the end of a year. The maternal mortality amounted to 5 per cent. It is easy to surmise the impression that such results would have on the mind of the obstetrician. He was, no doubt, also strongly influenced by his experience of cephalotripsy, and his unfortunate record with the remarkable forceps of Lovati, his predecessor in Pavia. In any case, there can be no question that, during the years 1874-75, Porro made many experiments in the removal of the uterus in pregnant rabbits, and took such opportunities as came in his way of operating on the cadaver, with the object of preparing himself for the operation which he ultimately performed on the living patient. His operation was entirely successful with regard to both mother and child. He published the case to the world a few months later—'Della amputazione utero-ovarico come complemento di taglio cesareo' (Milan, 1876). This is not the place to discuss the influence of Porro's operation upon the history of obstetrics during the last quarter of a century. But it may be remarked without irrelevancy that the interest aroused by the operation and the admiration excited by its conception and execution did a great deal for Italian obstetrics and gynæcology. Just as the participation by Sardinia with England and France in the Crimean War, attracted the attention of the world to a new factor in European politics and prepared and partly disciplined the Italian people for the events which ultimately culminated in Italian political unity, so the work of Porro attracted the attention of the medical profession in Europe to the achievements of Italian physicians and surgeons to an extent unknown since the schools of Padua and Bologna began to decline. *Propter hoc* or *post hoc*, the fact remains that it is only during the last quarter of a century that European Medicine has looked to Italy for scientific work worthy of its reputation in mediæval times; and perhaps it is not too much to allege that the stimulus thus produced led up to those recent Italian achievements in scientific medicine which the world recognises and appreciates.

In 1882, after seven years' incumbency, Porro resigned his chair in

Pavia and returned to Milan as Director of the Maternity Hospital. Formerly at Milan, during his period of office at Pavia, and again at Milan, Porro published a large number of contributions, on various subjects, to the progress of obstetrics and gynæcology. Latterly, in Milan, he devoted a considerable share of his energies to administrative, sanitary, and medico-legal work. Most noteworthy were the much-needed improvements in the sanitary condition of the hospitals, especially of the Ospedale Maggiore, brought about by his enlightened energy and influence. His last contribution to gynæcology, that on *Ovarioclasia*, was published in 1888. Among the medico-social improvements which he had the courage and the influence to effect was the introduction of a certain amount of control over some reckless practices of Italian midwives.

Among many indications of the public appreciation of Porro's disinterested and public-spirited efforts at social amelioration was his elevation to the dignity of Senator in November, 1891.

Last year the obstetricians of Italy determined, as well they might, to celebrate the twenty-fifth anniversary of Porro's operation, and they successfully appealed to the co-operation and sympathy of Europe and America. A medal was struck in commemoration of the event, and the task of compiling a record of all the Porro operations performed throughout the world until May 21, 1901, was entrusted to Professor Truzzi, of Padua. The result of that inquiry we have never been able to ascertain, but whatever the mere figures may show, the world will be none the less under eternal obligation to the man who had the genius to conceive, and the courage to execute, an operation so far-reaching in its beneficent influence upon the practice of obstetrics.

That Porro's unselfishness, and broad-minded and public-spirited philanthropy were appreciated by his fellow-citizens of Milan was clearly proved by the scene in that city on the day of his funeral. The people probably only vaguely apprehended the cause and import of his professional fame at home and abroad, but they understood and appreciated his work as reformer, sanitarian, and philanthropist, and they gave striking expression to their love and esteem for the living man by the way in which they deplored his death.

Porro's professional eulogists represent him as a man of lofty ideals, and full of physical, mental, and moral energy, which he expended in seeking to realize them. He was an honest gynæcologist, devoted to exact clinical observation. The strict integrity of his character prevented him from dealing otherwise than truthfully and conscientiously with the statistics of his work. Though all testimony represents him as an able and successful operator, he never succumbed to the operation mania. He looked to the remote as well as to the immediate results of his operations, and hence it was that, with an enormous *clientèle*, he distinguished himself by the comparatively small number of his operations. He was, therefore, little heard of at congresses and reunions of famous operating gynæcologists. Still, in the course of a comparatively short professional career it was a great thing to achieve such a reputation by strictly professional work and devotion to the cause of social amelioration, moral and physical, among his own people, that it could be said of him after his death, in the unmistakably earnest tones of conviction, that he was *vero cavaliere dell' umanità sofferente*.

REVIEWS OF RECENT BOOKS.

DEUX QUESTIONS OBSTÉTRICALES, par M. PAUL BAR, Professeur-Agrégé à la Faculté de Médicine, Accoucheur de l'Hôpital Saint-Antoine: Paris, 1902.

THE first obstetrical question discussed in this paper is of a twofold nature: Whether in cases of pelvic deformity it is ever justifiable (1) to induce labour prematurely; (2) to perform embryotomy upon a living child. The author answers both questions affirmatively, and in doing so expresses an opinion opposed to that of Pinard. The views of Pinard are discussed, and the author gives his reasons for differing from them.

He shows that in suitable cases premature labour gives excellent results as regards both mother and child, whilst such operations as symphyseotomy and Cæsarean section, even in the most skilful hands, are always of a serious nature. With reference to the question of performing embryotomy on a living child, he points out that the above-mentioned operations are only suitable under favourable circumstances, and he maintains that in a certain number of cases, in which the conditions are unfavourable, embryotomy, even on a living child, is justifiable. Thus, when the accoucheur is inexperienced as an operator, where the hygienic surroundings of the patient are bad, when there is evidence that the uterus is damaged by prolonged labour or infected by micro-organisms, or when the fœtal heart is slow, embryotomy, even on a living child, is to be preferred to symphyseotomy or Cæsarean section. The views of the author are clearly stated, and would, we think, be accepted by most British obstetricians.

The second part of the paper deals with purely ethical matters relating to the conduct of the accoucheur towards the parturient woman. The author holds that no operation should be performed without the consent of the patient or her friends, and that in the choice of an operation the patient's wishes must be regarded. In this also we think that M. Bar would have the support of the medical profession in this country.